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ASSESSMENT OF POST-ATTACK HEALTH RESOURCES

Final Report

Work Order OCD-OS-63-141  
OCD Work Unit No. 2421E

July 1, 1970

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System Sciences

INCORPORATED



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SUMMARY

Final Report

ASSESSMENT OF POST-ATTACK HEALTH RESOURCES

by

Charles G. Anderson

July 1, 1970

Prepared for the

Office of Civil Defense  
Office of the Secretary of the Army  
Washington, D.C. 20310

Work Order OCD-OS-53-141  
OCD Work Unit No. 2421E

DHEW Subcontract HSM-110-70-33

OCD REVIEW NOTICE

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SYSTEM SCIENCES, INC.  
4720 Montgomery Lane  
Bethesda, Maryland 20014

V. SUMMARY

This study is an assessment of the damage from a specific nuclear attack to the medical resources (personnel as well as facilities and supplies) of the following five U.S. cities:

1. San Jose, California
2. Albuquerque, New Mexico
3. Detroit, Michigan
4. New Orleans, Louisiana
5. Providence, Rhode Island

The surviving resources were found to be as follows on the Summary Table.

It was concluded that all the cities under study, with the exception of New Orleans would be able to organize and deploy at least a basic minimum of emergency medical care services. The damage in New Orleans was regarded as extensive enough to preclude a meaningful emergency medical care service.

SUMMARY TABLE

	<u>PROVIDENCE</u>	<u>SAN JOSE</u>	<u>DETROIT</u>	<u>ALBUQUERQUE</u>	<u>NEW ORLEANS</u>
<u>% Survival of</u>					
Government Medical Adm. Offices	100	61	41	36	37
Wholesale Medical Resources	100	56	52	38	8
Hospital Resources	100	79	76	27	14
Retail Medical Resources	100	65	67	28	5
Packaged Disaster Hospital Resources	100	83	97	51	100
<u>% Uninjured Personnel</u>					
MD	57	52	50	23	12
DDS	57	57	47	38	3
DVM	88	55	56	36	10
Pharmacists	59	61	49	38	4
En. Health Personnel	59	62	54	39	9
Registered Nurses	58	55	53	22	7

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## TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	BACKGROUND	2
III.	DISCUSSION	6
	A. Damage Assessment for Facilities, Supplies, and Equipment	6
	B. Personnel Casualty Assessment	11
IV.	RESULTS	14
	A. San Jose	14
	B. Albuquerque	32
	C. Detroit	49
	D. New Orleans	68
	E. Providence	88
V.	SUMMARY	103
	APPENDIX A -- Working Data	105
	APPENDIX B -- Medical Facilities	122
	References	190
	Distribution List	191



## I. INTRODUCTION

A medical system damage assessment analysis for each of the cities of the OCD 5-City Study is presented herein.

The sections given over specifically to each of the five cities are primarily graphic in nature with self-explanatory tables and charts covering appropriate summary level information.

The bulk of the basic working data has been relegated to the Appendices of the report.

Since the same techniques were used for each of the five damage assessments all the general discussion relevant to data sources, methodology, assumptions, etc. is covered in section III of the report. The discussion in section IV is limited to issues and situations only as they specifically apply to the city in question.

## II. BACKGROUND

The "5-City" medical system damage assessment was undertaken, at the request of OCD Research, by the Division of Emergency Health Services of the DHEW. The damage assessment analysis has been divided into two main phases. The first phase which was completed by PHS personnel involved the collection of the medical resources information and plotting the appropriate data on maps (scale 1:24000) for each of the five cities.

The second phase involved a detailed damage assessment for each of the five medical systems in question. This portion of the research effort, as presented herein, was subcontracted to System Sciences, Inc. by the USPHS under the following scope of work.

### SCOPE OF WORK

- A. Accept from the Division of Emergency Health Services, HSMHA the existing data on pre-attack:
  1. Health manpower as located by ZIP Code (Health personnel including physicians, dentists, veterinarians, nurses, pharmacists, sanitary engineers and sanitarians, using persons as units of measure.)
  2. Medical care facilities including inventories therein all as plotted on appropriate maps. (Medical facilities to include general and special hospitals, dispensaries,

clinics, nursing homes, packaged disaster hospitals, using beds as units of measure.)

B. Within the context of the particular post attack environment for each of the five cities assess the:

1. Damage to medical care personnel by using the casualty criteria developed by the Dikewood Corporation (reference 8), and
2. Damage to health supplies and equipment manufacturing and distribution facilities using free field overpressure as the primary indicator of damage, including a general overview of potential damage from fire and fallout.

C. For each of the five cities under consideration determine and describe the surviving:

1. Health personnel including physicians, dentists, veterinarians, nurses, pharmacists, sanitary engineers and sanitarians (using persons as units of measure),
2. Medical care facilities including general and special hospitals, dispensaries, clinics, nursing homes, packaged disaster hospitals (using beds as units of measure),
3. Medical supply and equipment groups including pharmaceuticals, biologicals, resuscitative fluids, and transfusion supplies, surgical textiles, emergency surgical

supplies and surgical instruments (using preselected indicator items and specific quantities as provided by the Division of Emergency Health Services under A.2. above, as units of measure).

The medical resource information used by System Sciences, Inc. for each of the five cities in this analysis was received from the Division of Emergency Health Services, DHEW. The facilities of most importance and therefore those with which this detailed analysis is primarily concerned include hospitals, convalescent hospitals, packaged disaster hospitals, nursing homes, government medical administration offices, medical manufacturers, medical wholesalers, and health supply facilities.

The exact location of each of the above type facilities in each of the five cities was plotted on maps (scale 1:24000). In addition to the above mentioned data, System Sciences, Inc. also received a substantial amount of unplotted medical resource information.

The plotted maps received from the Division of Emergency Health Services unfortunately are much too large to be incorporated in this report. Ideal as working material, they are impractical to include even as foldouts due to their size as well as the substantial and unnecessary increased cost involved in publication.

The small maps of each city area which are included in this report were plotted from the large working maps by visual transfer and no attempt was made to ensure specific accuracy. The actual damage analysis for each city was of course performed using the large and detailed maps. The

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schematic maps reproduced herein are intended to provide a general concept of the distribution of the facilities involved. If the reader wishes to pursue more specific detail as to the exact location of any particular facility he is referred to the OCD Five City Data Bank wherein the detailed plotted working maps have been filed.

### III. DISCUSSION

#### A. Damage Assessment for Facilities, Supplies, and Equipment

On the basis of references 1-5, the free field PSI applicable to each city was overlaid on the working maps. The medical facilities found to be within certain ranges were noted as such and recorded. The code and code number of all facilities in each of the PSI ranges involved are presented for each city. The code used in all cases is:

H = Hospital  
CH = Convalescent Hospital  
N = Nursing Home  
GA = Government Medical Admin. Offices (Local, State, or Federal)  
MH = Medical Manufacturer  
WH = Medical Wholesalers  
HS = Health Supply Facilities

For example, in San Jose on page 22 in the 9-10 PSI range, there are four medical manufacturers. They are specifically numbers 3, 4, 5, and 7. The exact names and addresses of these facilities can be found in Appendix B.

Once all facilities are grouped by level of weapon effect one can then apply a damage factor appropriate to the PSI in question. This damage factor applies to the contents of the buildings involved, NOT necessarily the buildings themselves and specifically is not applied to people. Damage to personnel is considered separately.

It is recognized that much of the supplies and equipment in any given building are considerably less vulnerable than the building itself. For example, surgical instruments are essentially indestructible regardless of the blast effect on the building. This is of course not true of all supplies, glass bottles being the notable exception. In any event the surviving supplies in this analysis are assessed on the assumption that a considerable portion of them may be temporarily inaccessible due to building collapse and debris formation. No distinction is made between the surviving supplies which are immediately available and those which are temporarily inaccessible.

The damage factors selected for supplies and equipment in this damage assessment are those developed by the URS corporation. To quote reference (7):

"In most occupancies, the durability of the typical contents is not too different from that of the interior panels with respect to displacement by blast. (An exception to this is permanently installed heavy industrial machinery or equipment.) If the blast intensity were sufficient to destroy the panels, in all likelihood the contents of the building would also suffer. In this same vein, if portions of the blast-formed debris from the interior panels were to be ejected from the building, it is logical to assume that part of the building contents would likewise be ejected from the building, the major part of the building contents would undoubtedly also be ejected. Thus, the debris charts can also be used for contents debris, by recognizing that the initial rising limb of most of the debris charts is essentially the result of panel failure. The beginning of the first plateau generally represents the point at which panel failure would be complete and--in accord with the relationship between panel failure and building contents ejection just described--it would also represent the point at which all the building contents

become debris. For lower overpressures, the percent of contents converted to debris can be estimated by linear interpolation."

Three classes of structures have been selected to represent the buildings of interest.

Class I. Multistory reinforced concrete shearwall buildings with masonry interior panels.

All hospitals are assumed to be this class of structure.

Class II. Multistory steel or reinforced concrete frame buildings with masonry exterior panels.

All medical manufacturers and wholesalers are assumed to be in this class of structure.

Class III. Unreinforced masonry load-bearing wall building.

All drug stores, nursing homes, convalescent hospitals, hospital supply, and government medical administrative facilities are assumed to be in this class of structure.

The building contents damage factors for each of the three classes adapted from the URS debris curves are as follows:



CLASS I		CLASS II		CLASS III	
PSI	% Surviving	PSI	% Surviving	PSI	% Surviving
13.5	0	12	0	10	0
13	10	11	10	9	16
12	44	10	25	8	44
11	62	9	40	7	68
10	66	8	50	6	84
9	72	7	60	5	93
8	76	6	70	4	100
7	80	5	80		
6	85	4	92		
5	90	3	100		
4	95				
3	100				
2	100				

In addition to the direct effects damage from blast, there can be substantial further loss from fire, particularly when considering building contents. The range and extent of fire damage is difficult to predict, depending upon weapon yield, type of construction, land usage, atmospheric visibilities, and other factors. In general, hospitals tend to be of fire-resistive construction with wide building separations. Since this analysis is primarily concerned with direct blast effects damage, no attempt will be made to specifically justify any fire damage factors. The factors listed below assume good visibility and are presented as current best estimates for the situation in question.

MEGATON AIR BURSTS			MEGATON GROUND BURSTS		
PSI	% Surviving Fire		PSI	% Surviving Fire	
	Hospitals	Commercial		Hospitals	Commercial
1-2	100	100	1-2	100	100
2-3	97	92	2-3	88	71
3-4	79	55	3-4	68	59
4-5	61	23	4-5	59	33
5-6	57	18	5-7	57	18
6-7	56	17	7-10	56	17
7-9	56	15	10-12	56	17
9-10		14			
10-11		14			

The damage assessment to facilities and supplies therefore involves two factors, blast and fire.

The next step in the analysis is to determine the quantitative information against which to apply the damage factors. By mutual agreement it was decided to use indicator items on the presumption that they would be representative of the medical resources in general. The quantity of each item estimated to be in each of the five cities was established by assuming that the amount per 1,000 people on hand in any area is uniform throughout the state involved. As tables A1-A5 in Appendix A show, the quantity per 1,000 people is known on a state-wide basis. Therefore, knowing the population in the five areas of interest the amounts at risk for purposes of this study are as shown on tables A6-A10 in Appendix A.

Unfortunately, except for hospitals (for which the specific number of beds is known), there is no available information regarding the city-wide distribution pattern of these indicator items. Therefore, except for hospitals the resources are assumed to be uniformly distributed among all the facilities of interest. For example, in San Jose (table A6) there are 1,420 pounds of aspirin at the wholesale level. Wholesale in this case is represented by the 28 medical wholesalers, the 19 medical manufacturers, and the 43 health supply facilities for a total of 90 individual locations in San Jose. Each facility is assumed to have 1,420 divided by 90 or about 16 pounds of aspirin.

On the basis of this generalized sort of assumption, the calculation of the amount destroyed is related directly to the fraction of the facilities destroyed.

The same principle applies to the loss of hospital resources, except that in the case of hospitals the distribution of beds is known. The fraction of the total hospital inventory is therefore directly related to the number of beds rather than the number of hospitals lost.

#### B. Personnel Casualty Assessment

With the exception of Albuquerque where the data was available only for physicians, the ZIP Code locations (1962 data) for physicians, dentists, veterinarians, pharmacists, environmental health personnel and registered nurses are known for each of the five cities.

ZIP Codes are of course large areas and in terms of the PSI zones of interest in this study it is impossible to establish the exact free-field PSI to which individuals in any given ZIP Code are exposed.

The technique used in this study was to assign a PSI value or a range of PSI values to each ZIP Code on the basis of visual inspections of the overlaid working maps. For example, the distribution of health personnel for San Jose and the range of PSI values are given for each ZIP Code in table 3 on page 27. Essentially this same concept is repeated for each city except that

personnel in each of the other four cities are exposed to varying levels of fallout radiation in addition to the direct weapon effects.

The level of fallout radiation applicable to the personnel in any given ZIP Code was determined essentially in the same manner as the level of blast exposure. The total ERD as described in references 1-5 was superimposed over each city and by visual inspection each ZIP Code was assigned a dose level. Therefore as table 20, page 82, describes for New Orleans the personnel are tabulated in groups considering both blast and radiation.

The blast damage factors used are those developed by Dikewood (reference 8). Use of the Dikewood curves requires some assumptions as to what types of buildings people are located in. Since this information is not available, in any reliable sense, it was decided to arbitrarily assume two classes of structures and an equal distribution of personnel. The structures selected are "Non-Seismic Reinforced Concrete" and "Brick." Tables A11-A16 of Appendix A indicate the blast casualty distribution in these two structural categories by yield and height of burst.

Since the personnel of interest in this analysis are a highly trained group it is reasonable to assume that at the time of attack they are all in some sort of shelter, therefore direct effects casualties are calculated only on the basis of blast which is the limiting casualty-producing mechanism for sheltered personnel. While the effects of fire on facilities and supplies is considered, personnel casualties from whatever fire problem which might exist are

NOT considered in this study. An analysis of this problem is substantially beyond the scope of this effort.

Indirect casualties resulting from the fallout radiation are however considered, but only in a general manner.

As stated above, all personnel are assumed to be located in two classes of structures. The "Non-Seismic reinforced concrete" has been assigned a PF value of 250 and the "Brick" a PF value of 25 with 50% of the personnel assumed to be in each category. No post-attack movement or other situation dynamics are considered. The radiation casualties are calculated on the basis of total ERD and the injury distribution used is taken from reference 9.

#### IV. RESULTS

##### A. San Jose

##### 1. Effects of Attack

##### a. Medical Facilities

The medical facilities under direct consideration in the San Jose damage assessment include:

- 24 Hospitals (H)
- 47 Convalescent Hospitals (CH)
- 17 Nursing Homes (N)
- 14 Government Medical Administrative Offices (GA)
- 19 Medical Manufacturers (MH)
- 28 Medical Wholesalers (WH)
- 43 Health Supply Facilities (HS)

The above listed facilities are represented schematically on figures 1-7.

The medical facilities in the San Jose area are not particularly concentrated at any given point. This dispersion, in addition to the relatively low PSI levels over much of the area of interest, accounts for comparatively high survival rates for both personnel and facilities.

For purposes of this damage assessment the San Jose area was divided into the following zones of direct overpressure and the facilities at risk in each were found to

# HOSPITALS -- SAN JOSE

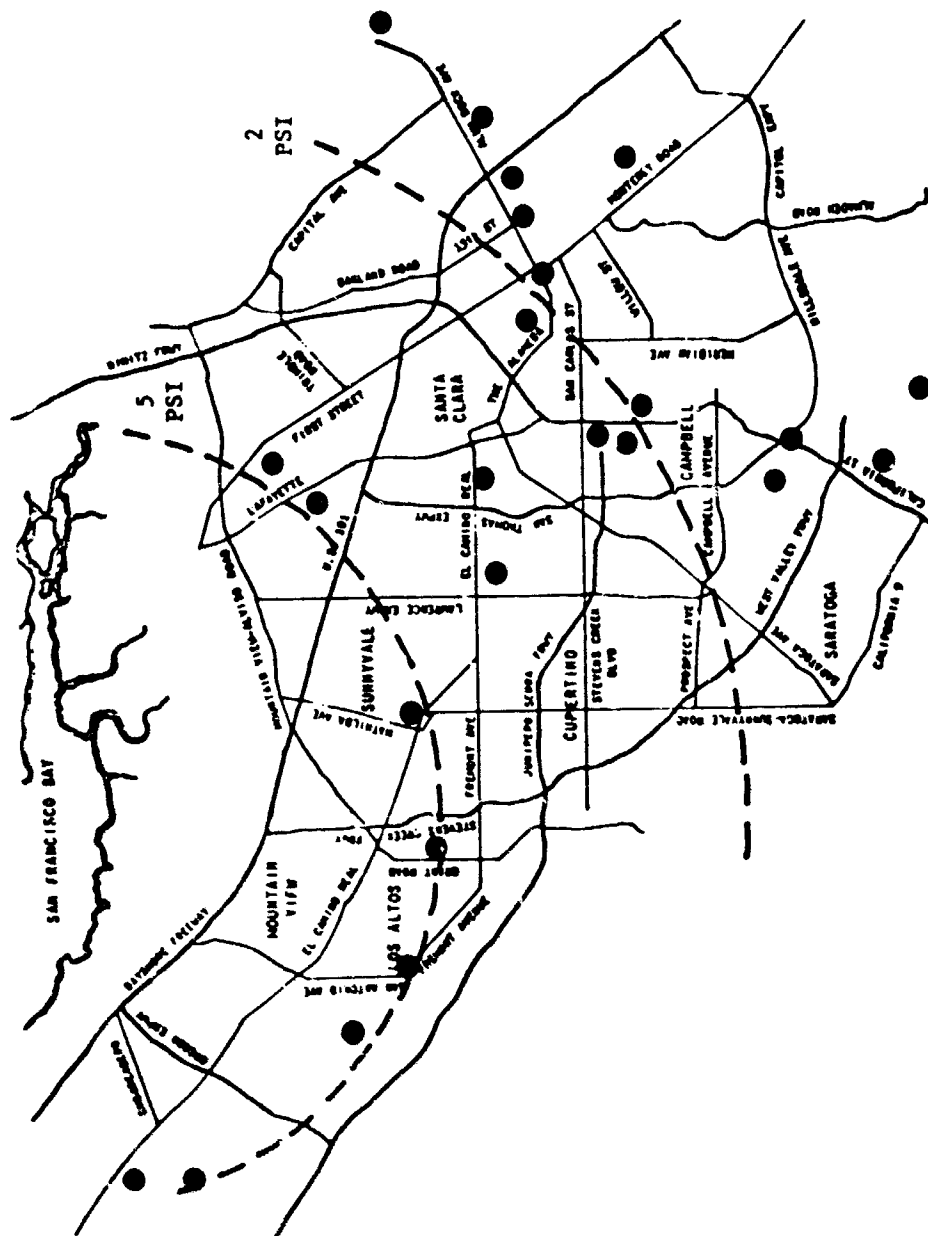


Figure 1

The map illustrates the San Francisco Peninsula with various police districts (PSD) and police stations (PSI). Key features include:

- Geographical Features:** San Francisco Bay, San Francisco Peninsula, and the San Jose Peninsula.
- Major Roads:** Highway 101, Highway 88, Highway 82, Highway 80, Highway 78, Highway 76, Highway 74, Highway 72, Highway 70, Highway 68, Highway 66, Highway 64, Highway 62, Highway 60, Highway 58, Highway 56, Highway 54, Highway 52, Highway 50, Highway 48, Highway 46, Highway 44, Highway 42, Highway 40, Highway 38, Highway 36, Highway 34, Highway 32, Highway 30, Highway 28, Highway 26, Highway 24, Highway 22, Highway 20, Highway 18, Highway 16, Highway 14, Highway 12, Highway 10, Highway 8, Highway 6, Highway 4, Highway 2, Highway 0.
- Police Districts (PSD):**
  - PSD 1: San Francisco
  - PSD 2: San Mateo
  - PSD 3: Santa Clara
  - PSD 4: San Jose
  - PSD 5: San Francisco
  - PSD 6: San Mateo
  - PSD 7: Santa Clara
  - PSD 8: San Jose
  - PSD 9: San Francisco
  - PSD 10: San Mateo
  - PSD 11: Santa Clara
  - PSD 12: San Jose
  - PSD 13: San Francisco
  - PSD 14: San Mateo
  - PSD 15: Santa Clara
  - PSD 16: San Jose
  - PSD 17: San Francisco
  - PSD 18: San Mateo
  - PSD 19: Santa Clara
  - PSD 20: San Jose
- Police Stations (PSI):**
  - PSI 1: San Francisco
  - PSI 2: San Mateo
  - PSI 3: Santa Clara
  - PSI 4: San Jose
  - PSI 5: San Francisco
  - PSI 6: San Mateo
  - PSI 7: Santa Clara
  - PSI 8: San Jose
  - PSI 9: San Francisco
  - PSI 10: San Mateo
  - PSI 11: Santa Clara
  - PSI 12: San Jose
  - PSI 13: San Francisco
  - PSI 14: San Mateo
  - PSI 15: Santa Clara
  - PSI 16: San Jose
  - PSI 17: San Francisco
  - PSI 18: San Mateo
  - PSI 19: Santa Clara
  - PSI 20: San Jose

Figure 2



# NURSING HOMES -- SAN JOSE

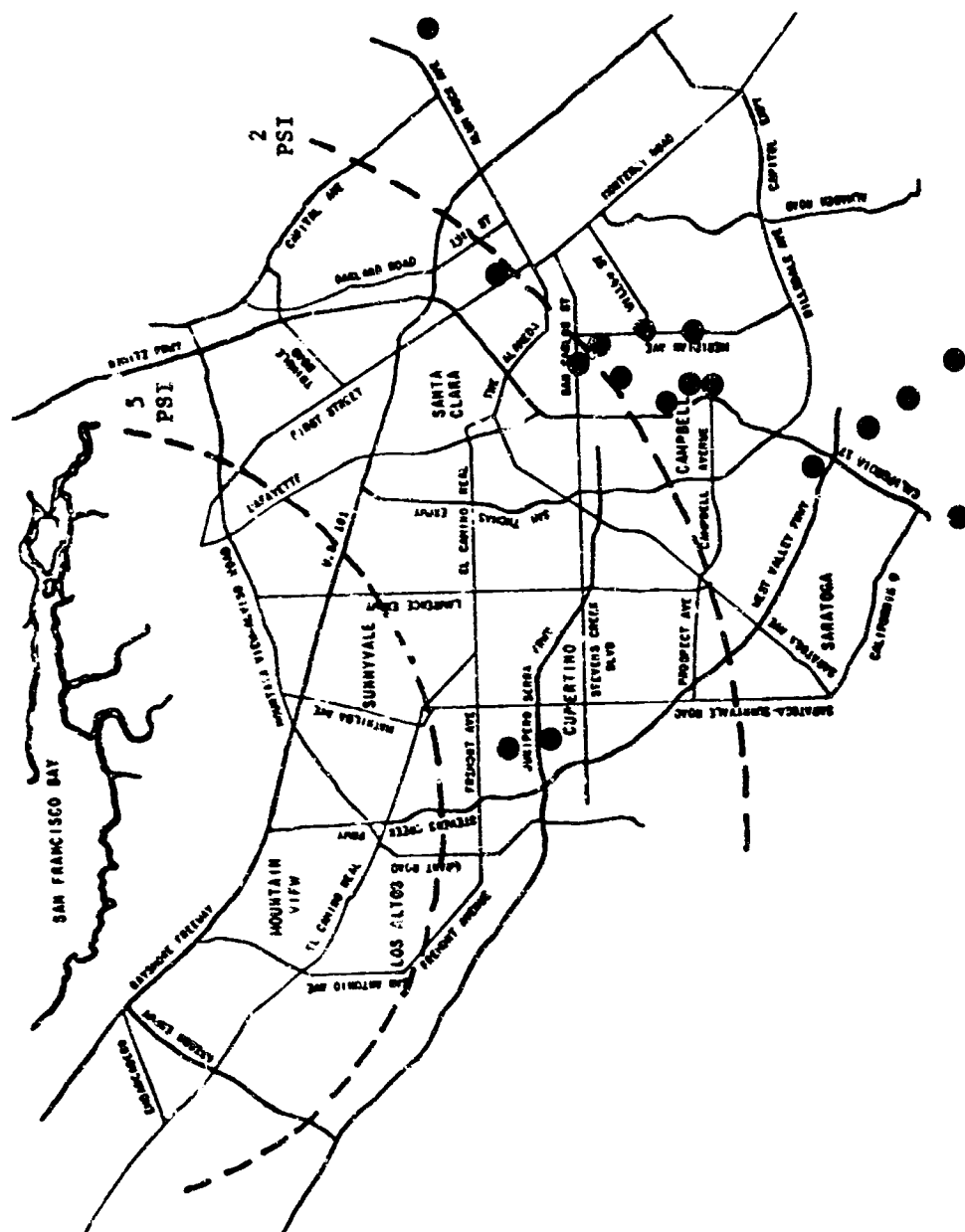


Figure 3

MEDICAL ADMINISTRATIVE OFFICES -- SAN JOSE

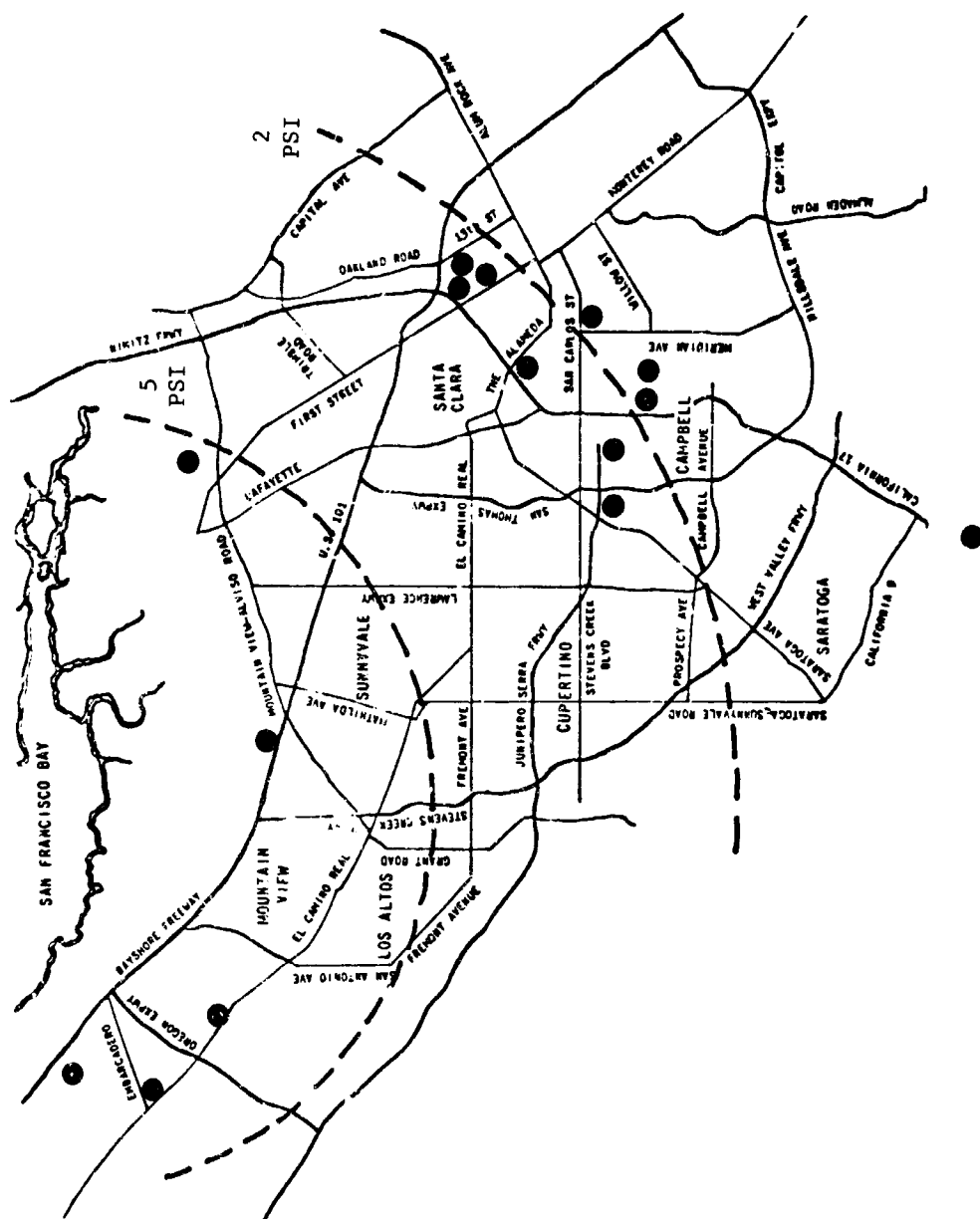


Figure 4

MEDICAL MANUFACTURERS -- SAN JOSE

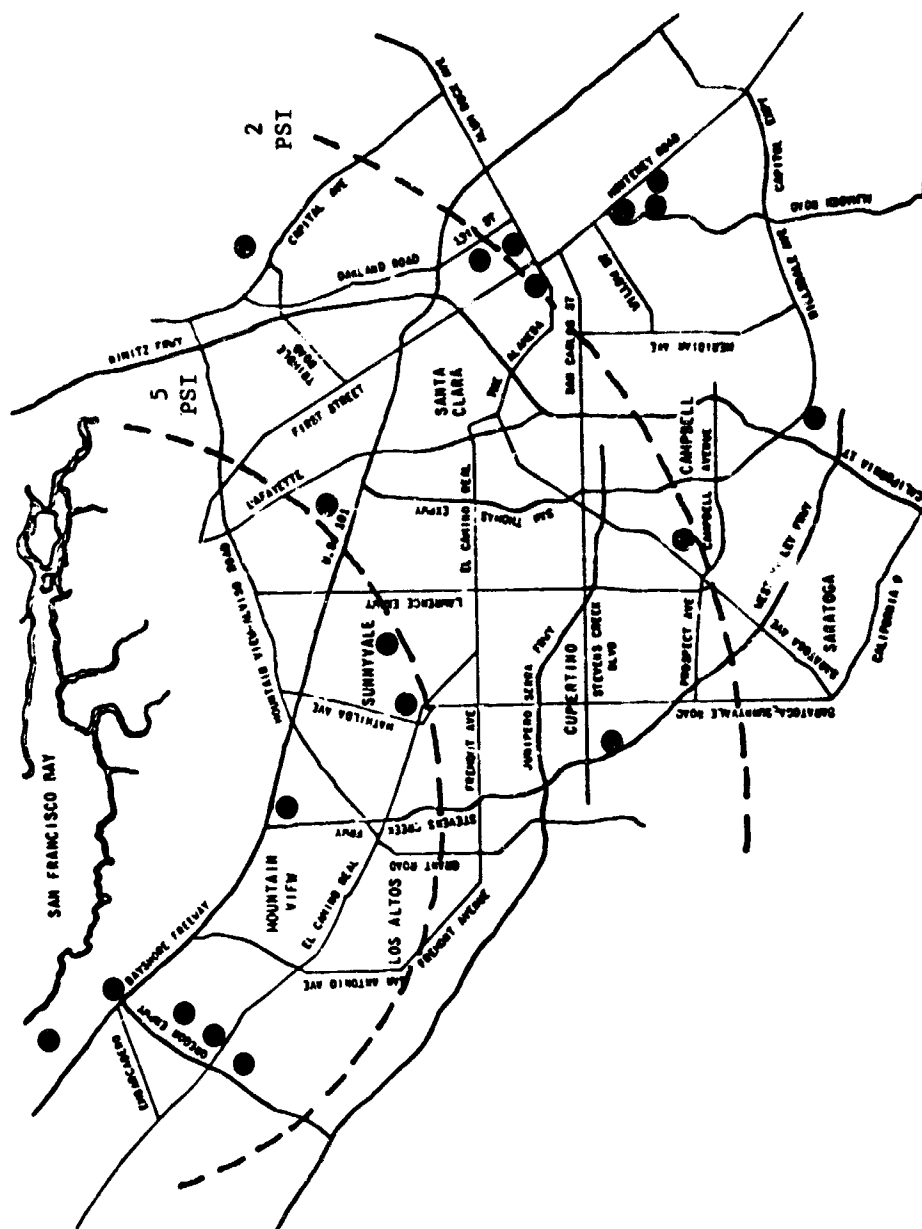


Figure 5

MEDICAL WHOLESALERS -- SAN JOSE

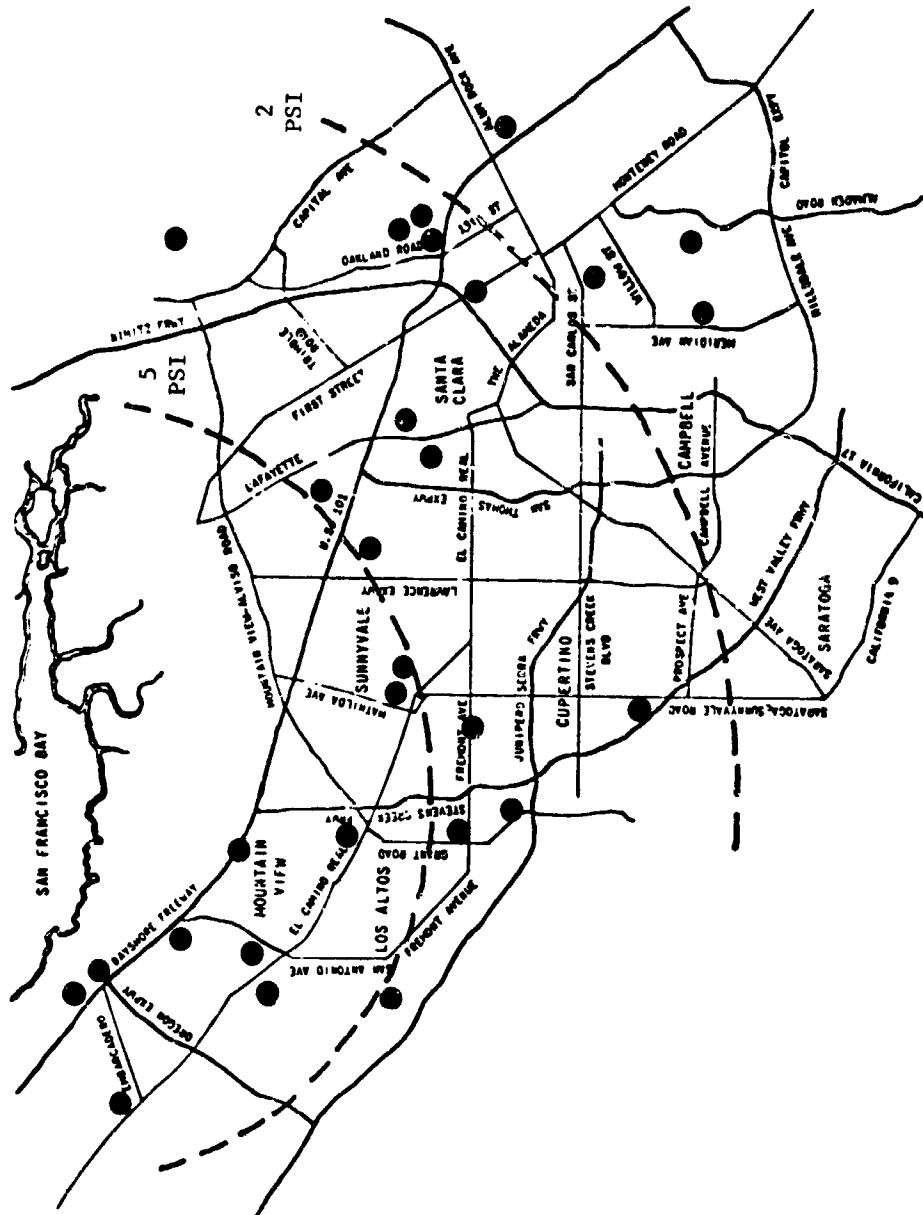


Figure 6

HEALTH SUPPLY FACILITIES -- SAN JOSE

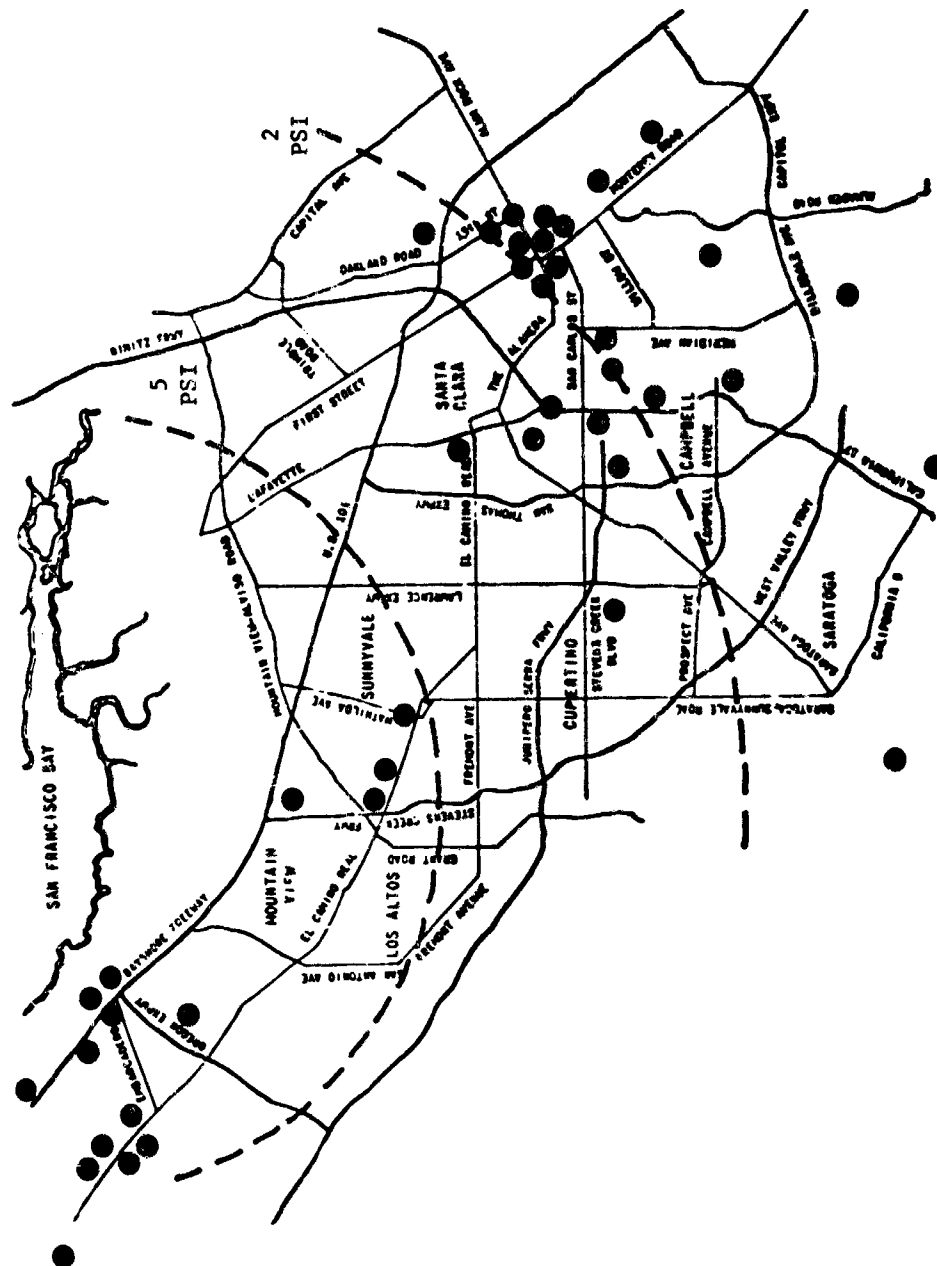


Figure 7

be as follows. The code numbers refer to the specific facilities listed in Appendix B.

<u>9-10 PSI</u>	<u>Code Numbers</u>
CH	7, 9, 25
GA	4
MH	3, 4, 5, 7
WH	2, 5, 6, 13
HS	2, 7, 8, 10, 11, 13, 20

<u>7-9 PSI</u>	<u>Code Numbers</u>
CH	4
GA	1
MH	1
WH	1, 12
HS	6, 12, 19

<u>6-7 PSI</u>	<u>Code Numbers</u>
H	3
GH	8, 14, 16
GA	2, 3
MH	2
WH	3, 4
HS	5, 9, 24

<u>5-6 PSI</u>	<u>Code Numbers</u>
H	1, 2, 6, 19, 24
GH	3, 15, 16, 24
GA	12
MH	8, 10
WH	10, 11, 15, 16
HS	4

<u>3-4 PSI</u>	<u>Code Numbers</u>
H	10
CH	2, 12, 23, 50
WH	9, 20
HS	3, 28
N	6

<u>2-3 PSI</u>	<u>Code Numbers</u>
H	9, 12, 14, 17, 20
CH	27, 38, 39, 40, 44, 45, 53, 54
N	20
GA	6, 7, 9, 10, 13, 15
MH	9, 12, 19
WH	17, 19, 22, 23, 24, 25, 27, 30, 31
HS	16, 26, 27, 32, 37, 45

<u>1-2 PSI</u>	<u>Code Numbers</u>
H	4, 7, 8, 11, 13, 15, 16, 18, 21, 22, 23
CH	17, 18, 19, 20, 21, 30, 31, 32, 33, 34, 35, 36, 41, 42, 43, 46, 47, 48, 49, 52
N	1, 2, 3, 4, 5, 10, 12, 13, 14, 15, 16, 17, 18, 19, 21
GA	8, 11, 14
MH	6, 15, 16, 17, 18, 20, 21
WH	7, 26, 28, 29
HS	14, 15, 22, 23, 29, 30, 31, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 44, 46, 47

Table 1 is a summary of the number of facilities by facility category at risk in each of the PSI zones. The portion surviving the direct effects is in parentheses and the portion surviving both the blast and the fire is underlined.

Unfortunately the retail drug inventory (drugstores) was not plotted on the master working map. This particular resource represents a substantial portion of the total resources under consideration so it cannot be overlooked. The damage to the retail drug inventory therefore was assessed by assuming that the location of drug stores would be directly related to the location of the pharmacists. There are 441 pharmacists in this study

SAN JOSE

Number of facilities at risk. Portion surviving the direct effects is in parentheses and the portion surviving both the blast and the fire is underlined.

	PSI:	(9-10)	(7-9)	(6-7)	(5-6)	(4-5)	(3-4)	(2-3)	(1-2)	TOTAL
Hospital beds (Regular)				2123 (1762) <u>986</u>	944 (830) <u>473</u>	373 (362) <u>221</u>	3733 (3620) <u>2860</u>	609 (609) <u>591</u>	1396 (1396) <u>1396</u>	9178 (8579) <u>6527</u>
Hospital beds (Packaged Disaster Hosp)					400 (352) <u>200</u>			200 (200) <u>194</u>	600 (600) <u>600</u>	1200 (1152) <u>994</u>
Convalescent Hospitals	3	1	3	4	4	4	4	8	20	47
	(.3) <u>0.042</u>	(.44) <u>0.066</u>	(2.25) <u>0.38</u>	(3.56) <u>0.64</u>	(3.88) <u>0.89</u>	(4) <u>2.2</u>	(4) <u>0.55</u>	(8) <u>7.36</u>	(20) <u>20</u>	(42.3) <u>31.6</u>
Nursing Homes							1	1	15	17
							(1) <u>0.55</u>	(1) <u>0.92</u>	(15) <u>15</u>	17 <u>16.5</u>
Govern. Medical Administrative Offices	1	1	2	1	(0.08) <u>0.014</u>			6 (6) <u>5.52</u>	3 (3) <u>3</u>	14 11 <u>8.5</u>
Medical Manufacturer	4	1	1	2	(1.5) <u>0.27</u>	1		3 (3) <u>2.76</u>	7 (7) <u>7</u>	19 (14.8) <u>10.6</u>
	(1.28) <u>0.179</u>	(0.5) <u>0.075</u>	(0.65) <u>0.11</u>	(1.5) <u>0.27</u>	(0.86) <u>0.19</u>					
Medical Wholesalers	4	2	2	4	(0.86) <u>0.19</u>	1	2	9 (9) <u>8.3</u>	4 (4) <u>4</u>	28 (22.4) <u>14.5</u>
	(1.28) <u>0.179</u>	(1) <u>0.15</u>	(1.3) <u>0.22</u>	(3) <u>0.54</u>	(0.86) <u>0.19</u>		(1.92) <u>1</u>			
Health Supply Facilities	7	3	3	1	(0.89) <u>0.16</u>	1	2	6 (6) <u>5.52</u>	20 (20) <u>20</u>	43 (33) <u>27.7</u>
	(0.7) <u>0.098</u>	(1.32) <u>0.19</u>	(2.25) <u>0.38</u>	(0.89) <u>0.16</u>	(0.97) <u>0.22</u>		(2) <u>1.1</u>			

Table 1



area and 227 drug stores which is a ratio of about 2:1.

On the basis of the above, the distribution of drug stores was taken to be as outlined in table 2.

b. Medical personnel

The medical and health-related personnel at risk in the San Jose area include:

- 1667 Physicians
- 467 Dentists
- 67 Veterinarians
- 441 Pharmacists
- 82 Environmental Health Personnel
- 4958 Registered Nurses

The ZIP Code locations of these health personnel and the associated level of weapons effects for each ZIP Code are given in table 3. Table 4 summarizes the data by weapons effects categories. In table 5, K represents the number killed, SI severely injured, and MI moderately injured. The total remaining uninjured is also given for each class of personnel.

2. Conclusion

The medical resources and the medical personnel in San Jose survive this particular attack fairly well.

Under the assumptions previously discussed the surviving resources (personnel and supplies) available for use in the immediate post-attack period include:

# DRUGSTORES -- SAN JOSE

<u>PSI</u>	<u>Number of Drugstores</u>	<u>Number Surviving</u>	
		<u>Blast</u>	<u>Blast and Fire</u>
8.0	12	5	0.8
7.5	31	15.5	2.5
6.0	15	12. 12.3	2.0
5.0	16	14.9	2.8
4.0	18	17.5	6.2
2.5	21	21	20.1
1.5	<u>114</u>	<u>114</u>	<u>11</u> <u>114</u>
TOTAL	227	200	148.4

Table 2

DISTRIBUTION OF HEALTH PERSONNEL -- SAN JOSE

<u>ZIP CODES</u>	<u>PSI</u>	<u>MD</u>	<u>DDS</u>	<u>DVM</u>	<u>PHARM</u>	<u>EN. HEALTH PERSONNEL</u>	<u>RN</u>
94040	7-9	46	15	5	22	2	419
94300	5-10	664	109	12	57	17	777
95050	3-5	37	22	5	35	4	421
94086	5-7	85	30	4	28	5	395
94022	4-6	77	33	6	30	1	339
95008	1-2	20	13	4	20	3	167
95030	1-2	91	23	7	26	3	211
95070	1-2	41	19	3	20	4	146
95035	2-3	3	2	0	2	1	22
95101	1-2	9	0	0	0	0	54
95103	1-2	1	1	0	1	0	3
95106	1-2	2	1	0	0	1	0
95108	1-2	3	0	0	1	0	10
95110	2-3	7	1	2	9	2	55
95111	1-2	0	0	0	3	2	25
95112	1-2	135	21	4	30	2	178
95113	1-2	67	41	1	12	2	3
95114	1-2	60	1	0	0	1	9
95116	1-2	0	0	0	0	0	32
95117	2-3	0	0	0	0	0	49
95118	1-2	0	0	0	0	0	40
95120	1-2	1	0	0	0	0	10
95121	1-2	0	0	0	0	0	1
95122	1-2	0	0	0	1	0	30
95123	1-2	0	0	0	0	0	5
95124	1-2	13	8	2	22	9	326
95125	1-2	55	43	4	43	10	286
95126	2-3	47	35	2	11	4	129
95126	1-2	21	14	2	23	2	206
95127	1-2	170	28	2	24	4	353
95129	2-3	10	3	0	18	2	187
95130	1-2	2	1	0	2	1	58
95132	2-3	0	0	1	1	0	8
95133	2-3	0	0	1	0	0	4

Table 3

DISTRIBUTION OF HEALTH PERSONNEL. -- SAN JOSE

<u>PSI</u>	<u>PHYSICIANS</u>	<u>DENTISTS</u>	<u>VETERINARIANS</u>	<u>PHARM.</u>	<u>EN. HEALTH PERSONNEL</u>	<u>REGISTERED NURSES</u>
8.0	46	14	5	22	2	419
7.5	664	109	12	57	17	777
6.0	85	30	4	28	5	395
5.0	77	33	6	30	1	339
4.0	37	22	5	35	4	421
2.5	67	41	6	41	9	454
1.5	691	220	29	228	44	2153

Table 4

NORTALITY AND INJURY DISTRIBUTION -- SAN JOSE

PSI	PHYSICIANS			DENTISTS			VETERINARIANS			PHARMACISTS			EN. HEALTH PERSONNEL			REGISTERED NURSES		
	K	SI	MI	K	SI	MI	K	SI	MI	K	SI	MI	K	SI	MI	K	SI	MI
8.0	4.6	5.5	29	1.4	1.6	9.2	0.5	0.6	3.3	2.2	2.5	14.4	0.2	0.1	1.2	41.9	50.3	276
7.5	77	73	418	11.9	11.9	69	1.3	1.3	7.5	6.3	6.3	36	1.9	1.9	10.6	85.5	85.5	489
6.0	4.3	9.3	57	1.5	3.3	20	0.2	0.3	2.7	1.4	3	18.7	0.3	0.5	3.3	19.7	43.1	265
5.0	7.7	7.8	50	0.6	5.4	21.4	0.1	0.5	3.9	0.7	3	19.5				7.9	34.1	226
3.5	0.4	3.3	20.7	0.1	2	12.2	0.05	0.4	2.8	0.3	3.1	19.6	0.04	0.4	2.1	4.1	37.9	236
2.5	4.3	30.7		2.7	18.9		0.4	2.8		2.7	18.9		0.6	4		29.5	29.5	208*
1.5			34.5		11			1.4			11.4			2.2				108
TOTALS BY INJURY CLASS	93	103	605	16	25	162	2	4	24	11	21	139	2	4	24	159	281	1807
TOTAL UNINJURED		886			266			37			270			52			2711	

Table 5

	<u>% of Pre-attack levels</u>
866 Physicians	52
266 Dentists	57
37 Veterinarians	55
270 Pharmacists	61
52 Environmental Health Personnel	62
2711 Registered Nurses	55

The moderately injured group as tabulated in table 5 represents a sizable number of people who in a short period of time could augment the uninjured group.

The supplies surviving (as described by indicator items) are listed in table 6. Approximately 75% of the resources survive.

It is evident that as a result of this particular attack environment there would be considerable disruption of all services but the medical resources which survive would be adequate to institute almost immediate post-attack medical care services on an austere basis. Approximately 50% of all health personnel survive uninjured with an additional large number only moderately injured. It would be likely that all essential (non-elective) medical services could be instituted on an area-wide basis within several days post-attack and that the necessary emergency life-saving procedures could be instituted immediately.

QUANTITIES SURVIVING -- SAN JOSE

<u>Item</u>	<u>Unit of Measure</u>	<u>Total</u> *	<u>Whole-sale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	1,256	63	945	248
Antibiotics, Broad Spec.	gm.	78,283	12,194	17,447	48,642
Antibiotics, Penicillin	Mill. U.	128,566	13,700	18,483	96,383
Aspirin	lb.	5,136	823	140	4,173
Bandage, Gauze, Roller	Sq. Yd.	18,460	3,303	6,011	9,146
Digitalis & Derivatives	1000 USP U.	411	74	55	282
Gauze Pads (Sponges)	1000's	837	111	596	130
IV Injection Sets	Each	3,981	189	3,792	0
IV Solutions	Liter	9,040	151	6,522	2,367
Narcotics (Morph or Equal)	1000 $\frac{1}{2}$ gr.	1,191	89	71	1,031
Needles, Hypo (Reusable)	Each	75,115	10,022	20,299	44,794
Scissors, Gen. Operating	Each	825	114	711	0
Syringe, Hypo (Reusable)	Each	14,659	2,026	9,292	3,341
Tetanus Toxoid	cc's	2,787	311	844	1,632
Thermometers, Clinical	Each	17,704	1,499	6,501	9,704

\* Available to Community (Post-Attack)

Table 6

B. Albuquerque

1. Effects of Attack

a. Medical Facilities

The medical facilities at risk in the Albuquerque area include:

- 15 Hospitals (H)
- 9 Nursing Homes (N)
- 14 Government Medical Administrative Offices (GA)
- 3 Medical Manufacturers (MH)
- 16 Medical Wholesalers (WH)
- 34 Health Supply Facilities (HS)

Each of the above listed facilities is represented schematically on figures 8-13. For purposes of this damage assessment the Albuquerque area was divided into the following zones of direct overpressure and the facilities at risk in each zone were found to be as follows:

<u>16-20 PSI</u>	<u>Code Numbers</u>
H	8
GA	13
HS	24, 28

<u>15-16 PSI</u>	<u>Code Numbers</u>
H	2, 10, 14
N	2, 6
HS	23

<u>10-11 PSI</u>	<u>Code Numbers</u>
WH	15
HS	11, 15, 22



# HOSPITALS - ALBUQUERQUE

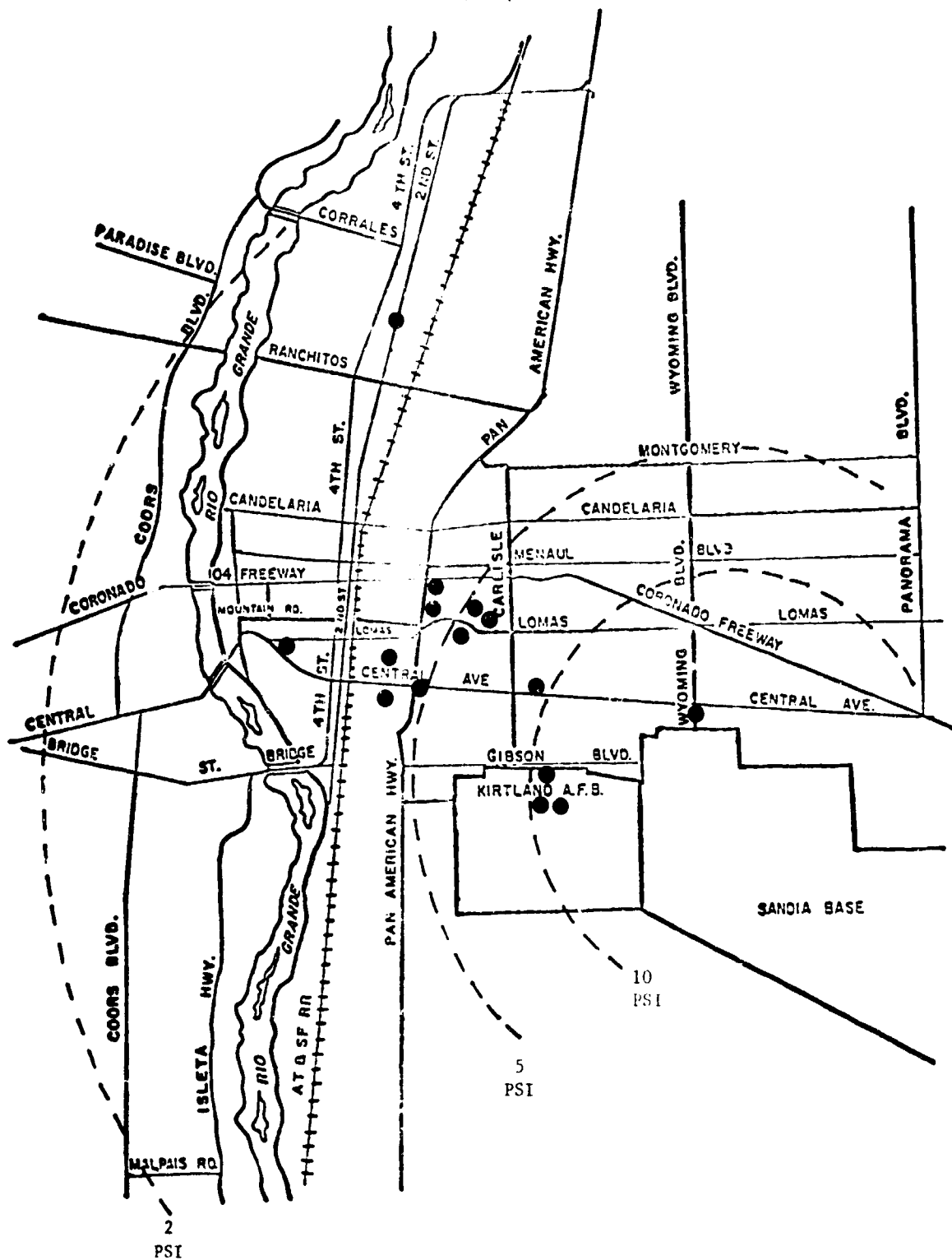


Figure 8

NURSING HOMES -- ALBUQUERQUE

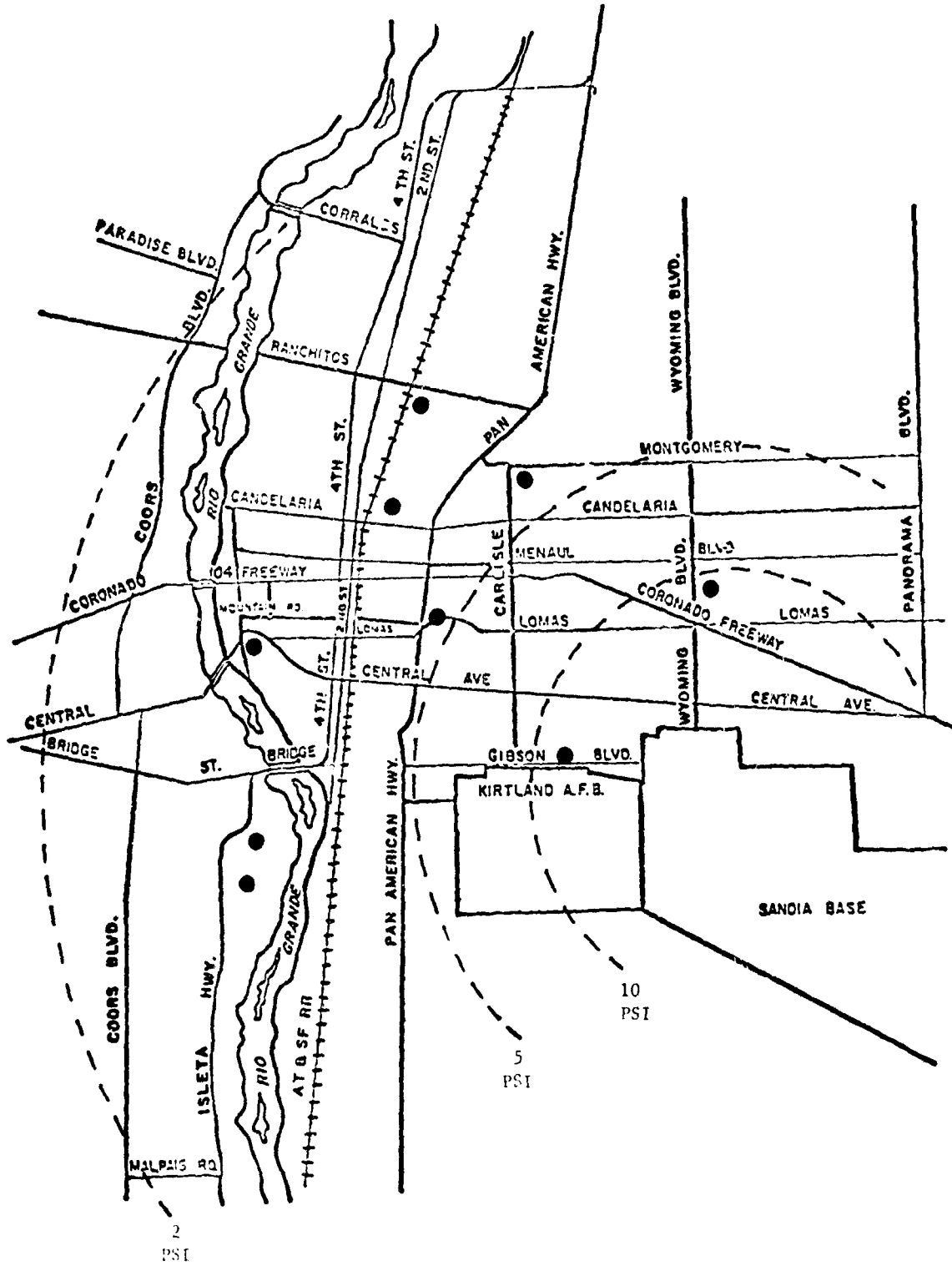


Figure 9

# MEDICAL ADMINISTRATIVE OFFICES -- ALBUQUERQUE

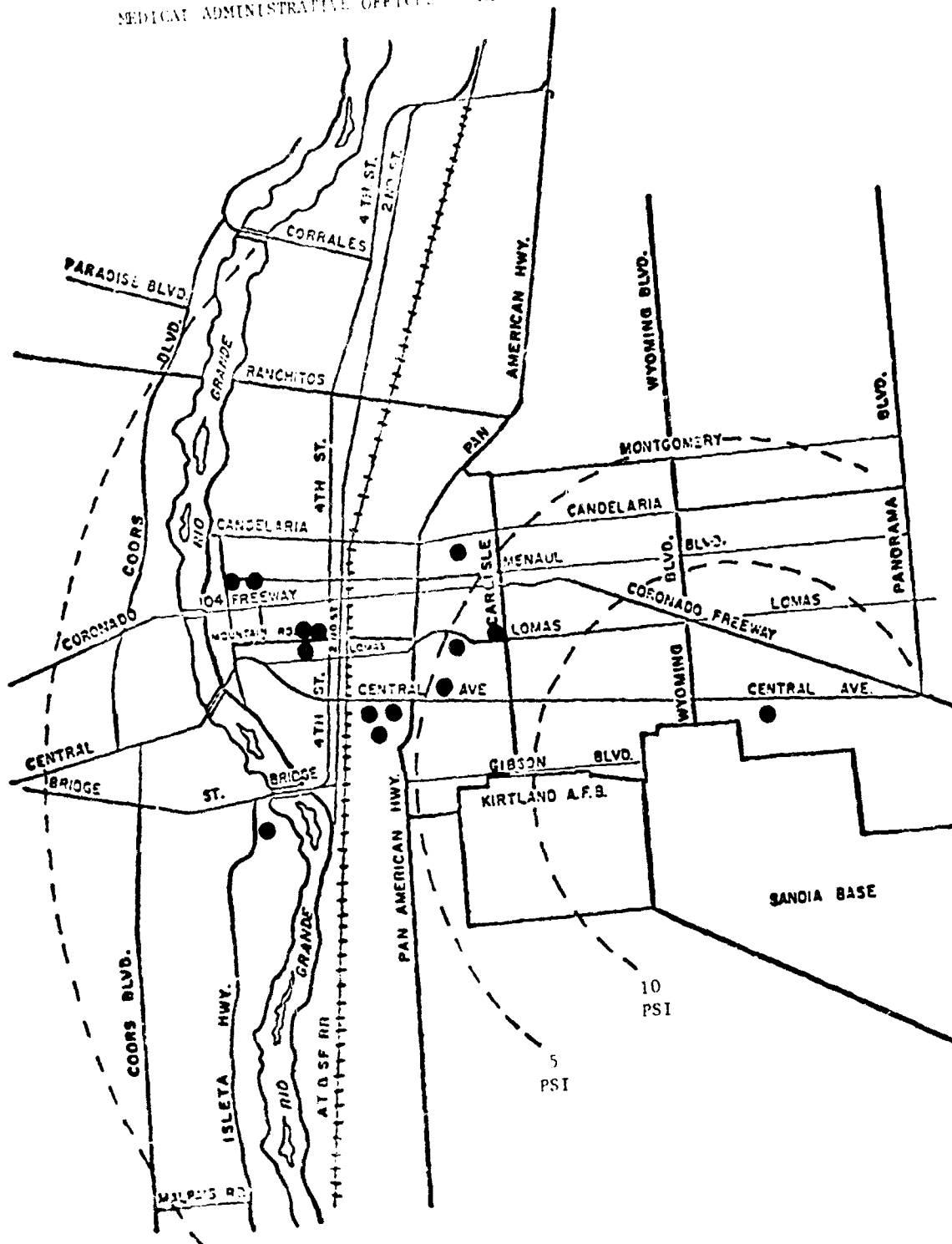


Figure 10

# MEDICAL MANUFACTURERS -- ALBUQUERQUE

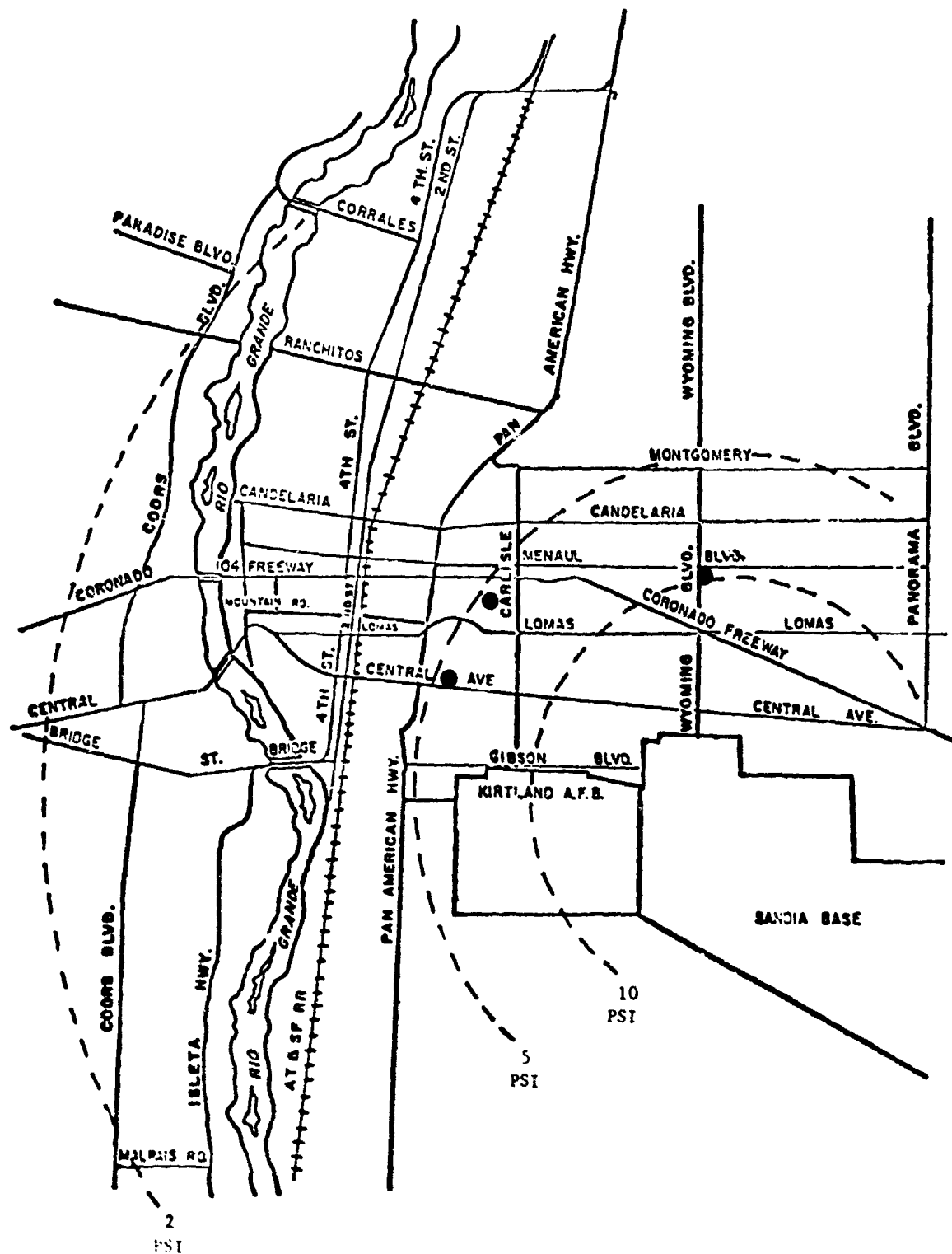


Figure 11

MEDICAL WHOLESALERS -- ALBUQUERQUE

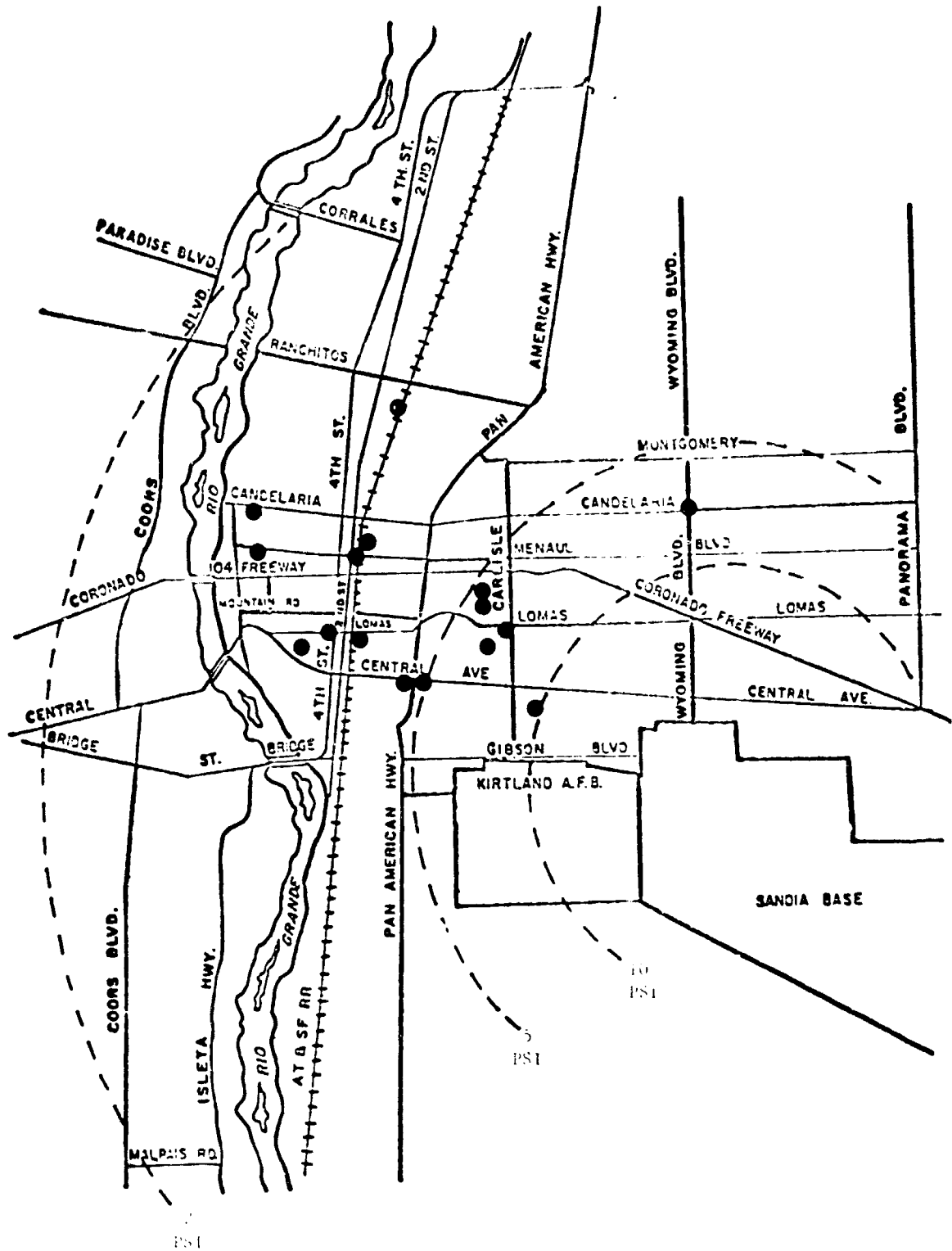


Figure 12

# HEALTH SUPPLY FACILITIES -- ALBUQUERQUE

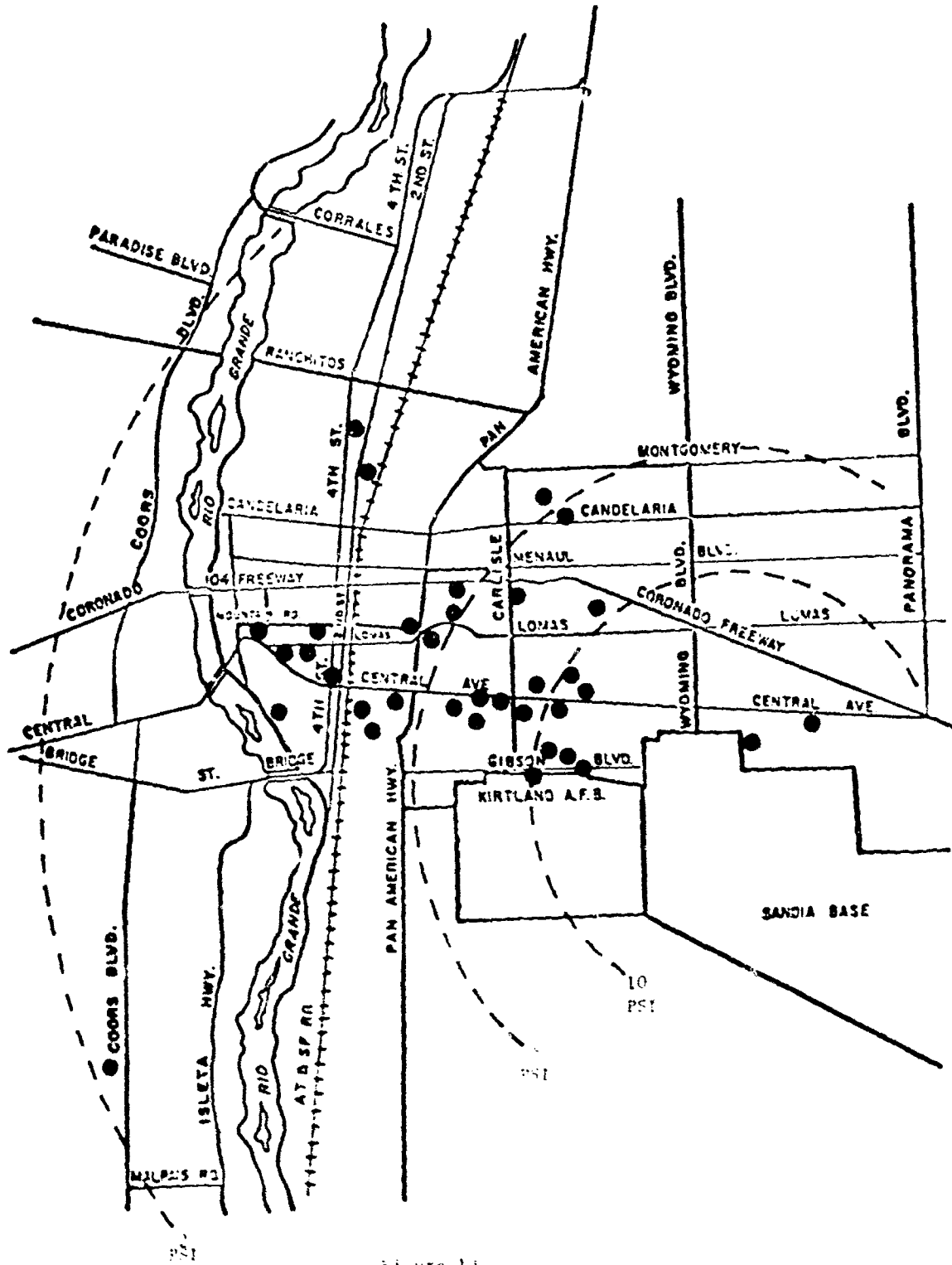


Figure 1

9-10 PSI                      Code Numbers

H	9
MH	2
HS	7, 31, 36

7-9 PSI                      Code Numbers

HS	8, 33
----	-------

6-7 PSI                      Code Numbers

WH	4, 8, 9
HS	21, 25

5-6 PSI                      Code Numbers

H	3, 6, 15
GA	6, 7, 12
MH	1, 3
WH	3, 5
HS	10, 14, 20, 32

4-5 PSI                      Code Numbers

H	1, 5, 7, 12, 13
N	5, 9
GA	2, 9, 10, 15
WH	7, 10, 16
HS	3, 12, 13, 26, 29, 34, 35, 39

3-4 PSI                      Code Numbers

H	11
N	3, 4
GA	1, 4, 5, 8, 11
WH	2, 6, 12, 13, 14
HS	2, 4, 5, 6, 16, 19

2-3 PSI                      Code Numbers

H	16
N	1, 7, 8
GA	16
WH	1, 11
HS	17, 18, 27

Table 7 is a summary of the number of facilities, by facility category, at risk in each of PSI Zones. The fraction surviving the direct blast effects is in parentheses and the fractions surviving both the blast and the fire is underlined.

b. Medical Personnel

The medical and health related personnel at risk in the Albuquerque area include:

- 438 Physicians
- 126 Dentists
- 39 Veterinarians
- 211 Pharmacists
- 36 Environmental Health Personnel
- 1369 Registered Nurses

The ZIP Code location for Albuquerque health personnel is known for physicians only, consequently some arbitrary assumptions must be made for the remaining personnel. The following criteria were developed.

- (1) Nurses are assumed to be distributed proportionately to physicians
- (2) Dentists, veterinarians, pharmacists, and environmental health personnel are assumed to be distributed proportional to the population in general

The ZIP Code location for physicians and nurses and the associated level of weapons effects for each ZIP Code



ALBUQUERQUE

Number of facilities at risk. Portion surviving the direct effects is in parentheses and the portion surviving both the blast and the fire is underlined.

	PSI	(16-20)	(17)	(10-11)	(9-10)	(7-9)	(6-7)	(5-6)	(4-5)	(3-4)	(2-3)	TOTAL
Hospital beds		8 (0) 0	766 (0) 0		9 (6.1) 3.4			329 (286) 103	610 (561) 342			1722 (853) 508
Hospital beds (Packaged Disaster Hosp)			200 (0) 0						200 (184) 112	200 (200) 154		600 (384) 306
Nursing Home			2 (0) 0						2 (1.9) .44	2 (2) 1.1	3 (3) 2.76	9 (6.9) 4
Government Medical Administrative Offices	1 (0) 0							3 (2.7) .49	4 (3.7) .85	5 (5) 2.7	1 (1) .92	14 (12.4) 5
Medical Manufacturer					1 (.32) .04			2 (1.5) .27				3 (1.82) 0
Medical Wholesaler				1 (.17) .238			3 (1.9) .31	2 (1.5) .27	3 (2.6) .59	5 (4.8) 2.6	2 (2) 1.84	16 (13) 6
Health Supply Facilities	2 (0) 0	1 (0) 0		3 (.24) .03	2 (.9) .13		2 (1.5) .25	4 (3.6) .65	8 (7.7) 1.8	6 (6) 3.3	3 (3) 2.8	34 (23) 9

Table 7

are given in table 8. Table 9 summarizes the data by weapons effects categories. In table 10 the casualties are identified by type with K representing killed, SI severely injured, and MI moderately injured. The number surviving uninjured is also given.

Since the remaining health personnel have been assumed to be distributed proportionately to the population in general, the casualty rates for the city at large will be applied. Reference 6 indicates that the city wide mortality rate was about 12% and the injury rate 35%. The mortality rate for physicians and nurses in this analysis is very close to the 12% for the population in general but the injury rate in this analysis is considerably higher, 66% vs. about 33%.

The mean between the two or about 50% will be used in this analysis. Therefore the casualty rates for medical personnel (except physicians and nurses) are assumed to be 12% mortality and 50% injury thus leaving 38% of the dentists, pharmacists, veterinarians, and environmental health personnel uninjured.

The fallout radiation in Albuquerque is uniformly quite low, i.e., (500-600 ERD). In this case, a protection factor of 10 is adequate to prevent mortality and injury. It is assumed that all medical survivors have access to shelter of at least a PF of 10 and therefore radiation as such is not a casualty mechanism.

DISTRIBUTION OF PHYSICIANS AND NURSES -- ALBUQUERQUE

<u>ZIP CODE</u>	<u>PSI</u>	<u>PHYSICIANS</u>	<u>REGISTERED NURSES</u>
87101	5	7	20
87102	5	10	30
87103	5	5	13
87104	5	4	13
87105	2	9	26
87106	4	198	621
87107	3	8	26
87108	11	103	318
87109	5	1	4
87110	7	78	251
87111	7	1	4
87112	16	10	30
87114	3	2	5
87115	18	1	4
87116	18	1	4

Table 8

DISTRIBUTION OF PHYSICIANS AND NURSES -- ALBUQUERQUE

<u>PSI</u>	<u>PHYSICIANS</u>	<u>REGISTERED NURSES</u>
2	9	26
3	10	31
4	198	621
5	27	80
7	79	255
11	103	318
16	10	30
18	2	8

Table 9

MORTALITY AND INJURY DISTRIBUTION -- ALBUQUERQUE

PSI	PHYSICIANS			NURSES		
	K	SI	MI	K	SI	MI
2	0	1	2	0	1	5
3	0	1	5	0	2	15
4	2	18	10	6	56	348
5	1	2	16	2	8	50
7	5	9	54	18	28	172
11	33	10	57	108	32	175
16	6	1	3	19	1	10
18	<u>1</u>	<u>0</u>	<u>1</u>	<u>5</u>	<u>1</u>	<u>2</u>
TOTAL	48	42	248	158	129	777
<hr/>						
TOTAL SURVIVING UNINJURED	100			305		

Table 10

## 2. Conclusion

The medical resources and the medical personnel in Albuquerque are both quite seriously depleted as a result of this attack.

Under the assumptions previously discussed the surviving resources (personnel and supplies) available for use in the immediate post-attack period include:

	<u>% of Pre-attack level</u>
100 Physicians	23
48 Dentists	38
14 Veterinarians	36
80 Pharmacists	38
14 Environmental Health Personnel	39
305 Registered Nurses	22

The moderately injured group as tabulated for physicians and nurses in table 10 represents a sizable number of people who in a short period of time could augment the uninjured group.

The supplies surviving (as described by indicator items) are listed in table 11.

The fallout, even though it is relatively low level, is nevertheless sufficiently high to preclude immediate outside activity. Therefore there would be a short period immediately post-attack in which the population would be pinned down and medical care activity would of necessity be limited accordingly.

As soon as fallout radiation levels permitted, it is likely that Albuquerque would be able to organize and implement a medical

QUANTITIES SURVIVING -- ALBUQUERQUE

<u>Item</u>	<u>Unit of Measure</u>	<u>Total</u> *	<u>Whole-sale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	205	12	156	37
Antibiotics, Broad Spec.	gm.	13,388	3,029	2,880	7,479
Antibiotics, Penicillin	Mill. U.	19,777	1,909	3,009	14,859
Aspirin	lb.	786	122	23	641
Bandage, Gauze, Roller	Sq. Yd.	2,598	199	997	1,402
Digitalis & Derivatives	1000 USP U.	68	15	9	44
Gauze Pads (Sponges)	1000's	124	6	98	20
IV Injection Sets	Each	627	0	627	0
IV Solutions	Liter	1,439	0	1,074	365
Narcotics (Morph or Equal) 1000 $\frac{1}{2}$ gr.		190	19	12	159
Needles, Hypo (Reusable)	Each	10,855	614	3,352	6,889
Scissors, Gen. Operating	Each	117	0	117	0
Syringe, Hypo (Reusable)	Each	2,076	24	1,538	514
Tetanus Toxoid	cc's	442	52	140	250
Thermometers, Clinical	Each	2,717	166	1,074	1,477

\* Available to Community (Post-Attack)

Table 11

care system which would at least be sufficient to meet the emergency needs of the situation. It would be quite some time (weeks) however, before medical services could be given over to anything but emergency and life-saving procedures.



C. Detroit

1. Effects of Attack

a. Medical facilities

The medical facilities under direct consideration in the the Detroit damage assessment include:

91 Hospitals (H)  
103 Nursing Homes (N)  
44 Government Medical Administrative Offices (GA)  
88 Medical Manufacturers  
47 Medical Wholesalers (WH)  
153 Health Supply Facilities (HS)

Each of the above listed facilities is represented schematically in figures 14-19. While there is some concentration in the downtown area, it is evident that a large portion of all the listed facilities is located outside the 5 PSI line with a substantial part of these below 3 PSI. Moreover, in contrast to the situation in New Orleans, the weapon impact area of Detroit is particularly void of medical resources.

For purposes of this damage assessment the Detroit area was divided into the following zones of direct over-pressure and the facilities at risk in each were found to be as follows:

<u>&gt; 30 PSI</u>	<u>Code Numbers</u>
	1, 28, 64
	23
	15



# SLACKING HOMES -- DETROIT

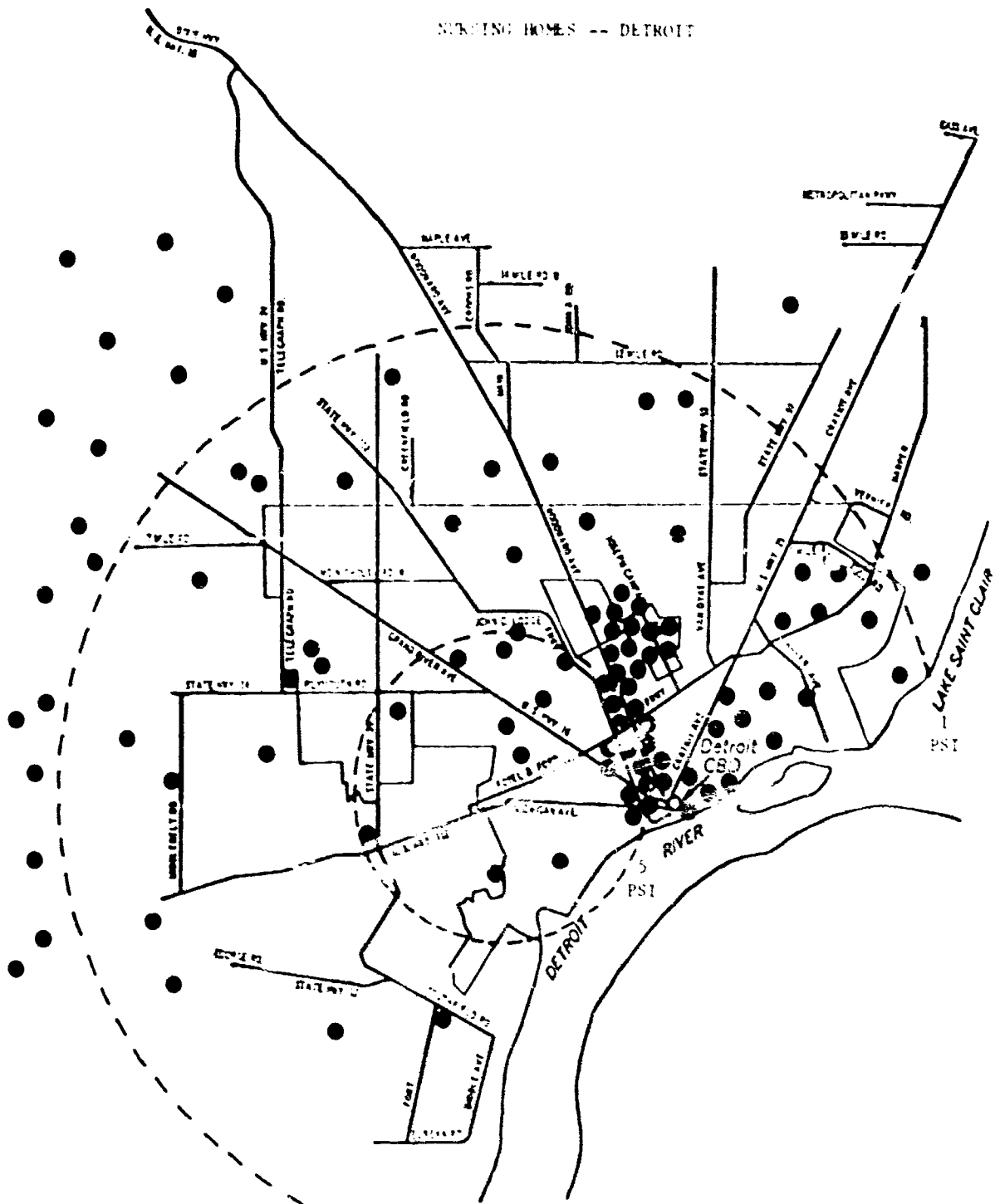


Figure 1

# MEDICAL ADMINISTRATIVE OFFICE - DETROIT

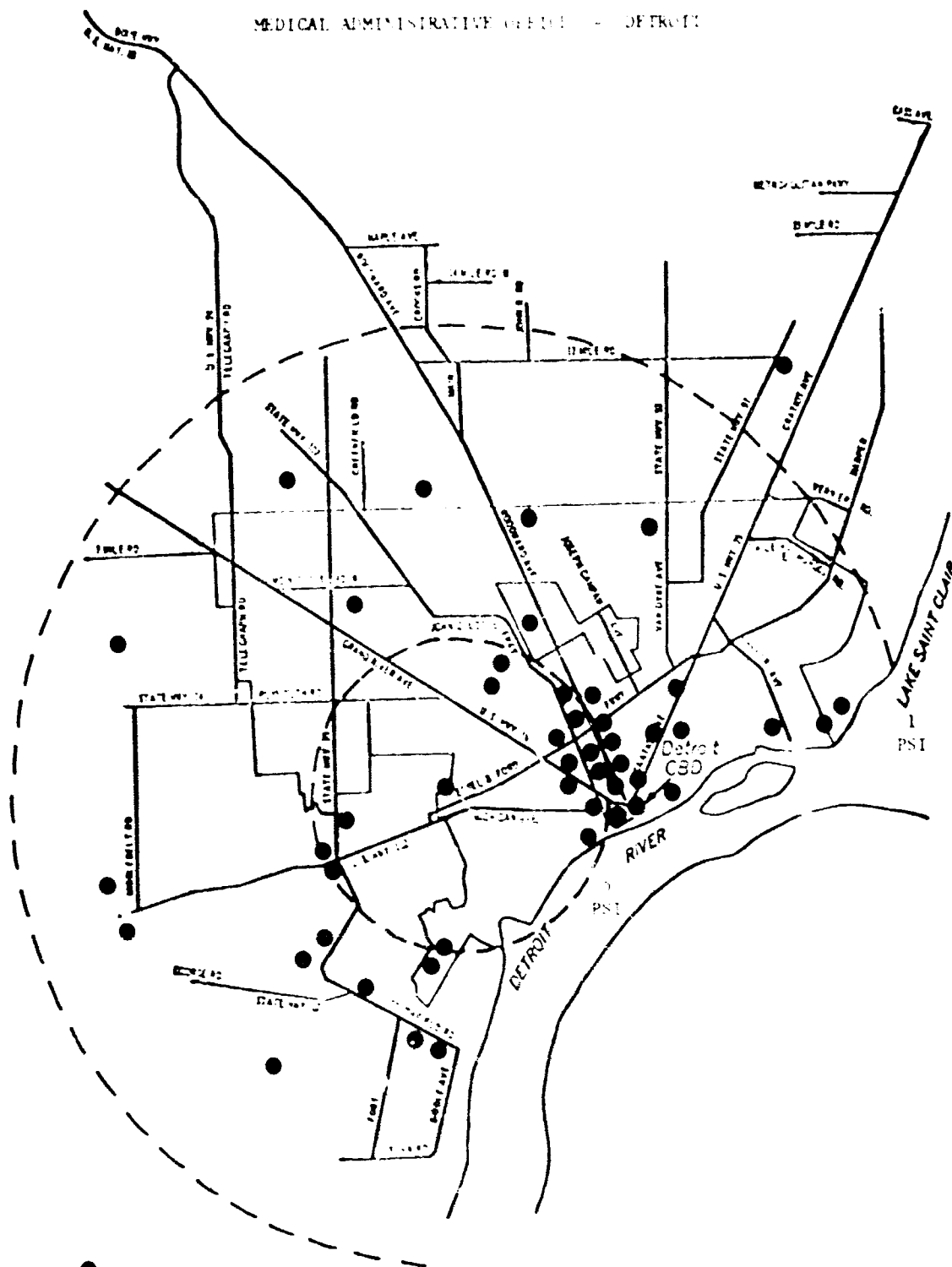


FIGURE 10

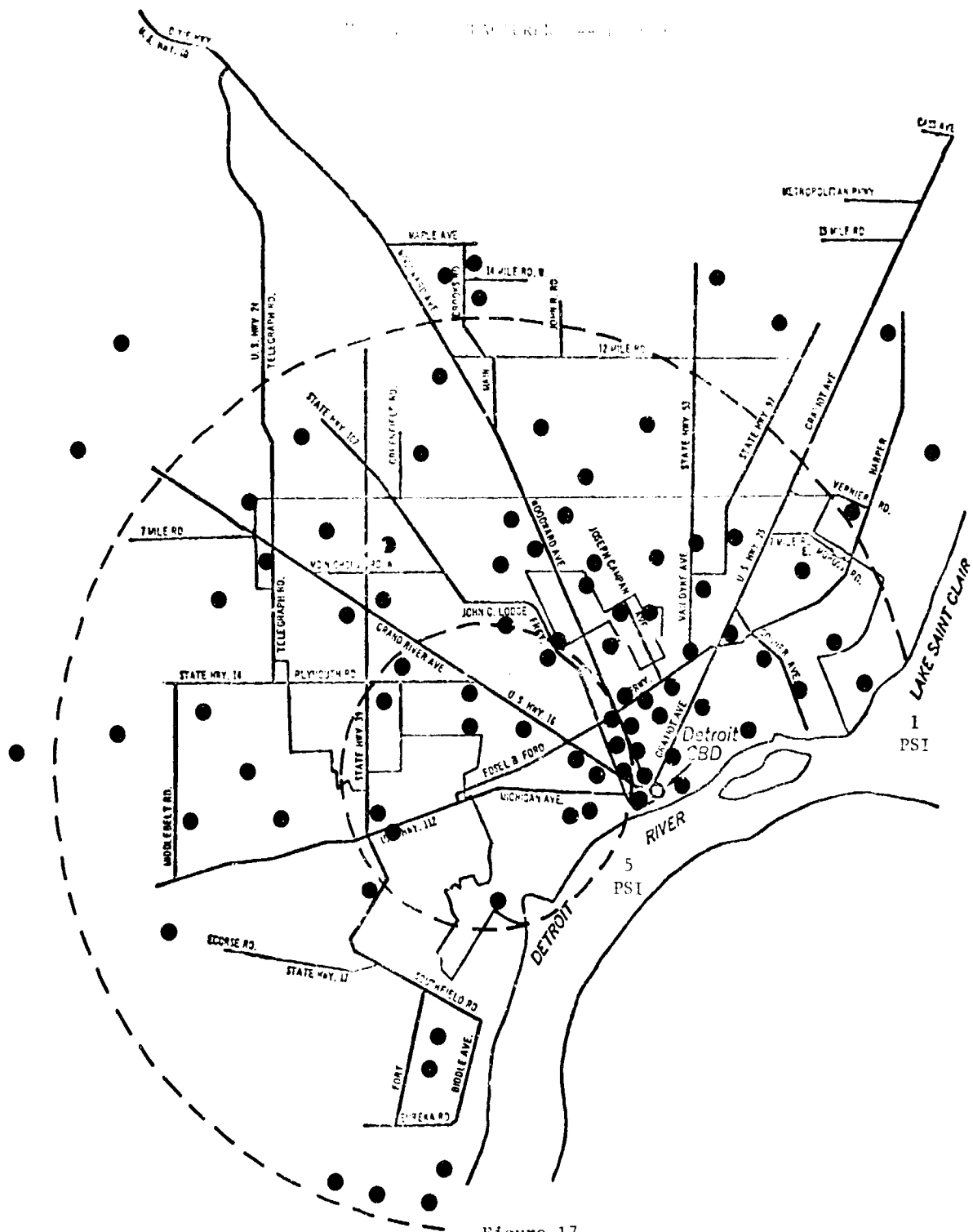


Figure 17

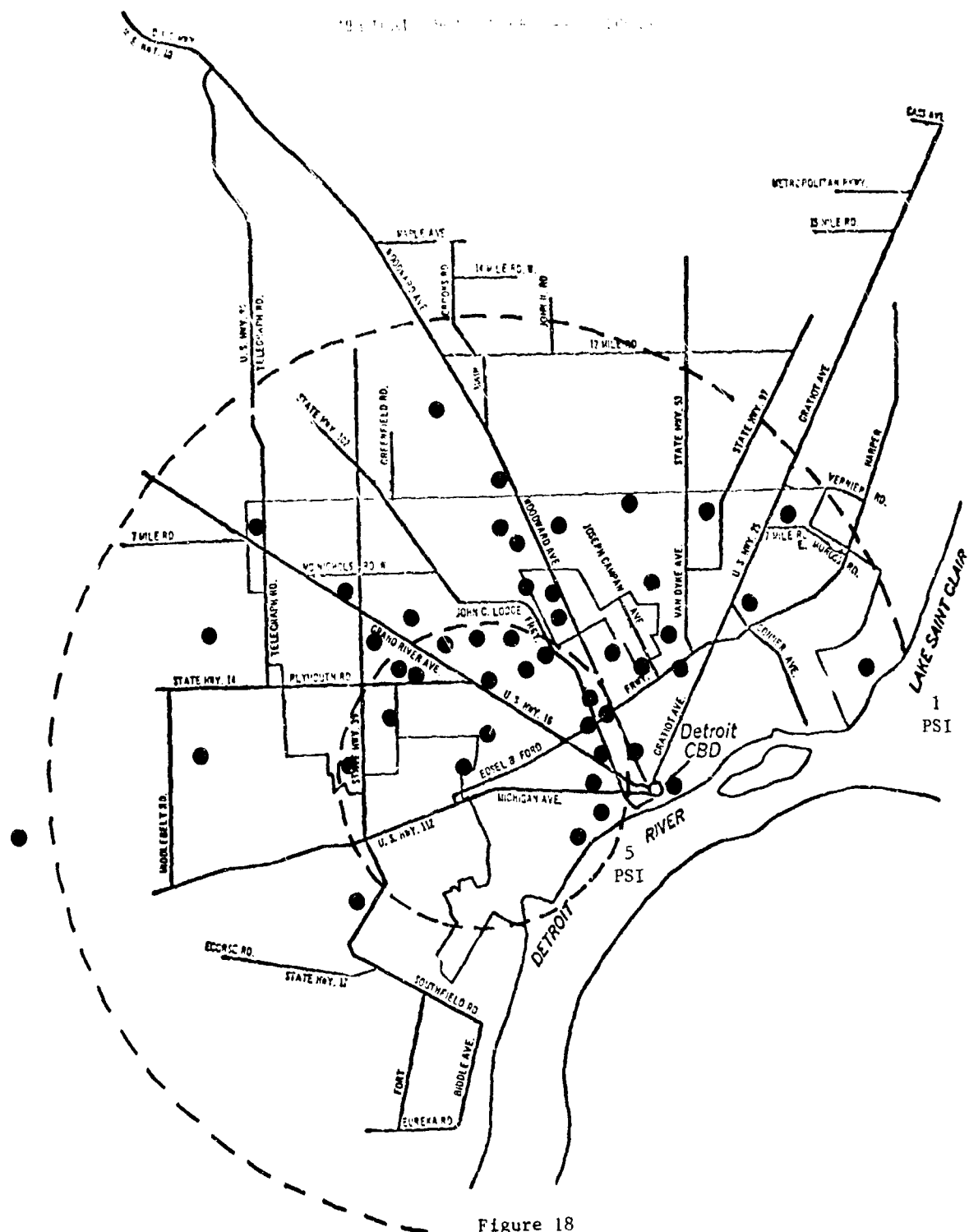


Figure 18



<u>18-30 PSI</u>	<u>Code Numbers</u>
M	11, 31, 41
WH	2, 47
HS	45

<u>18-30 PSI</u>	<u>Code Numbers</u>
H	43, 58
N	11
GA	2
MH	4
WH	11
HS	7, 86, 140

<u>12-18 PSI</u>	<u>Code Numbers</u>
H	6, 27, 45, 56
N	14, 52, 64
GA	3, 4
MH	3, 31
WH	8
HS	31, 38, 46, 63, 79, 87, 89, 99

<u>7.5-12 PSI</u>	<u>Code Numbers</u>
H	11, 19, 30, 34, 40
N	9, 49, 53, 73
GA	11, 29
MH	11, 19, 35, 39
WH	10, 14, 15, 19, 33, 38
HS	58, 77, 92

<u>4.5-7.5 PSI</u>	<u>Code Numbers</u>
H	8, 9, 10, 20, 36
N	8, 16, 20, 22, 37, 43, 54, 57, 61, 62
GA	22, 31, 37, 39, 40
MH	10, 18, 20, 26, 28, 48
WH	7, 16, 17, 35, 36, 41
HS	12, 30, 33, 40, 64, 68, 90, 98, 101

<u>4.5-5.5 PSI</u>	<u>Code Numbers</u>
H	2, 5, 12, 13, 17, 18, 22, 24, 33, 48, 50, 51, 53, 54, 63, 74, 75, 84



<u>4.5-5.5 PSI</u>	<u>Code Numbers</u>
N	3, 4, 6, 7, 15, 27, 28, 33, 34, 48, 55, 68, 69, 72, 74, 76
GA	6, 7, 10, 13, 14, 19, 21, 28, 38, 41, 43, 46, 47
MH	17, 21, 23, 24, 29, 40, 57
WH	1, 5, 9, 20, 42
HS	11, 14, 24, 26, 42, 44, 47, 52, 55, 59, 61, 76, 78, 93, 100, 109, 143, 149, 150
<u>3.8-4.5 PSI</u>	<u>Code Numbers</u>
H	3, 4, 39, 55, 77, 117
N	12, 13, 19, 21, 26, 31, 38, 39, 40, 45, 71, 84
GA	18, 24, 48
MH	2, 33, 42, 45, 49, 63, 64
WH	21, 23, 30, 34
HS	6, 17, 36, 65, 67, 75, 85, 88, 96, 105, 107, 145, 146, 158
<u>3-3.8 PSI</u>	<u>Code Numbers</u>
H	14, 25, 29, 42, 59
N	46, 47, 50, 67, 75, 83
GA	5, 27, 42
MH	9, 27, 37, 47, 62
WH	12
HS	2, 3, 8, 9, 27, 51, 53, 57, 70, 110, 144, 156, 157
<u>2-3 PSI</u>	<u>Code Numbers</u>
H	7, 15, 16, 21, 26, 31, 32, 44, 57, 62, 71, 73, 91, 92, 93, 118, 119
N	1, 2, 5, 10, 17, 24, 25, 42, 44, 51, 56, 59, 60, 70, 85, 104, 126
GA	1, 8, 12, 16, 17, 25, 26, 36
MH	1, 5, 6, 8, 9, 12, 13, 15, 16, 25, 32, 44, 46, 50, 53, 54, 55, 56, 62, 67, 68, 70, 75, 76, 77, 78, 79, 82
WH	3, 6, 13, 18, 24, 26, 28, 29, 31, 32, 40
HS	1, 4, 5, 10, 13, 16, 19, 20, 21, 28, 29, 32, 35, 37, 39, 41, 49, 54, 60, 69, 73, 74, 80, 82, 83, 84, 91, 94, 102, 103, 106, 111, 112, 123, 124, 125, 126, 127, 133, 141, 147, 148, 159, 160, 161, 162, 163, 164

<u>Facility</u>	<u>Code Numbers</u>
R	38, 47, 66, 78, 79, 80, 81, 82, 83, 85, 86, 87, 88, 89, 90, 107, 113, 115, 121, 129, 130, 133, 134, 135, 137
N	18, 77, 78, 80, 86, 89, 90, 91, 92, 96, 97, 98, 99, 100, 107, 108, 136
GA	23
MI	58, 59, 65, 72, 73, 74, 81, 86, 88, 89, 93
WH	39, 44
HS	23, 48, 113, 114, 115, 116, 118, 119, 121, 122, 134, 136, 138, 139, 151, 152, 167, 168

Table 12 represents a summary by facility category at risk in each of the PSI zones.

The number in parenthesis is the portion surviving the direct blast damage and the underlined number represents that portion which survives both the blast and the fire.

The damage assessment to the retail pharmacies in Detroit was accomplished in the same manner as it was for San Jose. The drugstores were assumed to be distributed as the pharmacists, consequently the associated PSI levels and the surviving fractions are given in table 13.

#### b. Medical Personnel

The medical and health related personnel at risk in the Detroit area include:

Best Available Copy

Table 12

FSI	Number of Petail Brugstores	Number Surviving	
		<u>Blast</u>	<u>Blast &amp; Fire</u>
<1	44	44	44
1.5	61	61	61
2	22	22	16
2.5	50	50	35
3	11	11	8
3.5	3	3	1
4	2	2	1
4.5	15	14	5
5	3	2	1
5.5	27	24	4
7.5	8	3	0
>12	<u>15</u>	<u>0</u>	<u>0</u>
	TOTAL 261	236	176

Table 13

Table 14  
 Estimated Health Personnel  
 at Risk to Weapons Effects

The ERD's for all these health personnel and the associated factors of weapons effects for each ZIP Code were calculated in table 14. The personnel at risk to the various levels of blast and radiation. All ERD values given in tables 14-16 were calculated on the assumption that half the populations had a PT of 25 and the other half a PT of 250. All ERD's below 120 were not considered.

Table 15 lists the numbers of blast casualties by type for each of the PSI zones. K represents the number killed, SI seriously injured, MI moderately injured and UI uninjured. While table 15 does not list the specific ERD values the casualty rates are for blast alone without regard to radiation. Table 16 lists the casualty spectrum including the radiation casualties. The first line in table 16 includes all the blast casualties who were not also radiation casualties. The subsequent lines represent casualties from radiation plus blast or radiation alone. The total figures of table 16 represent all casualties (blast and radiation). The uninjured survivors are also listed on table 16.

						NO. HEALTH CERAMIC	RN
1				6	7	13	2353
1				1	18	1	195
1		179	22	10	93	5	600
1.5	N/A	616	112	38	456	14	2613
1.5	120		6	0	4	0	13
1.5	160	27	19	1	21	1	102
1.5	260	30	26	2	27	0	139
1.5	280	101	54	6	48	1	282
2	A	255	165	21	200	18	1312
2.5	N/A	639	241	18	316	7	1549
2.5	120	8	11	1	9	0	78
2.5	140	99	31	3	37	1	199
2.5	180	17	19	0	17	0	48
2.5	200	70	44	4	71	2	322
3	N/A	160	71	7	101	1	257
3.5	N/A	139	16	1	25	6	78
4	N/A	17	7	0	13	0	26
4.5	N/A	315	131	10	143	13	1025
5	N/A	231	67	0	12	9	13
5	140	231	66	1	12	8	14
5.5	N/A	768	195	9	206	10	1458
5.5	140	553	57	1	41	2	227
5.5	200	6	4	0	4	0	19
7.5	N/A	120	31	2	73	0	299
7.5	480	8	4	0	5	0	20
12	N/A	98	42	4	57	0	212
12	200	34	21	3	31	0	131
18	N/A	86	64	3	56	1	70

Table 14

\* See page 61

**PERSONNEL CASUALTIES (BLAST) -- DETROIT**

PSI	ERD	MD				DDS				DVM				PHARM				EN. HEAVY TH				RN			
		K	SI	MI	UI	K	SI	MI	UI	K	SI	MI	UI	K	SI	MI	UI	K	SI	MI	UI	K	SI	MI	UI
1	N/A	0	0	0	714	0	0	0	273	0	0	0	35	0	0	0	276	0	0	0	33	0	0	0	2353
1	220	0	0	0	34	0	0	0	20	0	0	0	1	0	0	0	28	0	0	0	1	0	0	0	195
1	300	0	0	0	179	0	0	0	82	0	0	0	10	0	0	0	93	0	0	0	5	0	0	0	600
1.5	N/A	0	12	129	475	0	6	65	241	0	1	8	29	0	9	96	351	0	0	3	11	0	52	548	2013
1.5	220	0	0	1	2	0	0	3	3	0	0	0	0	0	0	2	2	0	0	0	0	0	1	6	6
1.5	240	0	0	6	21	0	0	4	15	0	0	0	1	0	0	4	17	0	0	0	1	0	2	78	22
1.5	260	0	1	6	23	0	0	5	21	0	0	1	1	0	0	5	22	0	0	0	0	0	3	29	107
1.5	280	0	2	21	77	0	1	11	42	0	0	1	5	0	1	10	37	0	0	0	0	0	6	59	217
2	N/A	0	10	79	166	0	7	51	107	0	1	6	14	0	8	62	130	0	0	6	12	0	52	406	852
2.5	N/A	0	38	242	356	0	14	91	134	0	1	7	10	0	19	120	177	0	0	3	4	0	93	589	867
2.5	120	0	1	3	4	0	1	4	6	0	0	0	1	0	1	3	5	0	0	0	0	0	5	30	43
2.5	140	0	6	38	55	0	2	12	17	0	0	1	2	0	2	14	21	0	0	1	0	0	12	76	111
2.5	180	0	1	6	10	0	1	7	11	0	0	0	0	0	1	6	10	0	0	0	0	0	3	18	27
2.5	200	0	4	27	40	0	3	17	20	0	1	1	2	0	4	28	40	0	0	1	1	0	19	122	180
3	N/A	0	11	74	75	0	5	33	33	0	1	3	3	0	7	46	46	0	0	1	0	0	18	118	118
3.5	N/A	0	12	71	44	0	1	8	7	0	0	1	0	0	2	13	8	0	1	3	2	0	7	40	25
4	N/A	1	1	9	6	0	1	3	3	0	0	0	0	0	1	7	5	0	0	0	0	1	2	14	9
4.5	N/A	3	31	189	91	1	13	79	38	0	1	6	3	1	14	86	41	0	1	8	4	10	102	615	297
5	N/A	5	25	143	56	1	7	41	17	0	0	0	0	0	2	7	3	0	1	6	2	0	2	8	3
5	140	5	25	143	56	1	8	41	17	0	0	1	0	0	2	7	3	0	0	6	2	0	2	9	3
5.5	N/A	23	100	50	154	6	23	127	39	0	1	6	2	6	25	134	41	1	1	6	2	44	175	948	291
5.5	140	17	66	359	110	2	7	37	11	0	1	0	0	1	5	27	8	0	1	1	0	7	27	147	45
5.5	200	0	1	3	2	0	1	2	1	0	0	0	0	0	1	2	1	0	0	0	0	1	2	12	4
7.5	N/A	12	16	78	14	3	4	20	4	0	1	1	0	7	9	47	9	0	0	0	0	29	39	194	36
7.5	480	1	1	4	2	0	1	2	1	0	0	0	0	0	2	2	1	0	0	0	0	2	3	11	4
12	N/A	62	5	31	0	26	2	13	0	2	1	1	0	36	3	18	0	0	0	0	0	133	11	68	0
12	200	21	2	11	0	13	1	7	0	1	1	1	0	19	2	10	0	0	0	0	0	82	6	42	0
18		86	0	0	0	64	0	0	0	3	0	0	0	56	0	0	0	1	0	0	0	70	0	0	0

Table 15

MORTALITY AND INJURY DISTRIBUTION -- DETROIT

	MD				DDS				DVM				PHARM				ENV. HEALTH				RN			
	K	SI	MI	UI	K	SI	MI	UI	K	SI	MI	UI	K	SI	MI	UI	K	SI	MI	UI	K	SI	MI	UI
120R	0	1	4	3	0	1	5	5	0	0	0	1	0	1	4	4	0	0	0	0	0	5	34	39
140R	22	117	560	181	3	21	94	37	0	1	3	1	1	12	51	26	0	1	9	1	7	57	248	127
180R	0	3	8	6	0	5	10	6	0	0	0	0	0	3	8	6	0	0	0	0	0	8	23	17
200R	22	17	51	21	13	10	31	11	1	2	2	1	20	17	50	20	0	0	2	0	89	67	216	98
220R	0	0	17	20	0	3	12	11	0	0	1	0	0	2	17	13	0	0	1	0	8	57	62	81
240R	1	7	13	6	0	5	9	5	0	0	1	0	6	9	5	5	0	0	1	0	5	10	86	1
260R	2	10	15	3	1	9	13	3	0	1	1	0	1	9	13	4	0	0	0	0	5	46	69	14
280R	10	32	52	6	5	18	28	3	1	1	3	1	5	16	25	2	0	0	0	0	28	106	132	19
300R	22	74	74	9	10	34	34	4	1	4	4	1	12	39	38	4	1	2	2	0	72	249	249	30
480R	4	4	0	0	1	3	0	0	0	0	0	0	1	4	0	0	0	0	0	0	15	5	0	0
TOTAL	275	526	1889	2770	134	190	767	981	8	17	54	101	147	208	851	1171	3	7	51	71	516	1163	4667	729
Uninjured Survivors	2770				981				101				1171				71				7292			

Table 16



## 2. Conclusion

The medical resources in the Detroit area survive this particular attack surprisingly well. The uninjured medical personnel include:

	<u>% of Pre-attack levels</u>
2770 Physicians	50
981 Dentists	47
101 Veterinarians	56
1171 Pharmacists	49
71 Environmental Health Personnel	54
7292 Registered Nurses	53

The other medical resources which survive the attack, by indicator items, are given in table 17.

The surprising high survival rate in Detroit for both personnel and supplies is essentially attributable to two factors of about equal impact. One of these factors is that a substantial area outside the Detroit city limits was included in this analysis, consequently many of the resources were outside the area of direct effects. This area-wide inclusion is important since in a very real sense any possible post-attack operations in the Detroit area would of necessity be an integrated effort between the city proper and all the immediately adjacent areas.

The other reason why survival rates are fairly high is the location of Ground Zero. As can be seen in figures 14-19 the weapon impact area is relatively devoid of medical resources. Even though there is some concentration of resources downtown

in the 5 PSI region there is also a substantial amount widely dispersed across the rest of the study area.

While the surviving medical personnel and supplies are substantial, their use immediately post-attack would of course be limited by the fallout radiation. Much of the area is subjected to high levels of radiation and it would be some time (several days) before even emergency medical operations could begin. In those areas west and south of the impact area emergency medical care could be fairly immediate since the dose rates there are quite low.

As soon as fallout decayed to tolerable levels the Detroit area would be capable of mounting an effective and substantial medical care system.

QUANTITIES SURVIVING -- DETROIT

<u>Item</u>	<u>Unit of Measure</u>	<u>Total</u>	<u>Whole-sale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	7,510	267	6,208	1,305
Antibiotics, Broad Spec.	gm.	485,200	64,316	114,164	306,720
Antibiotics, Penicillin	Mill. U.	519,648	45,888	120,933	352,827
Aspirin	lb.	68,034	8,209	922	58,903
Bandage, Gauze, Roller	Sq. Yd.	105,936	7,118	39,322	59,496
Digitalis & Derivatives	1000 USP U.	2,312	248	363	1,701
Gauze Pads (Sponges)	1000's	5,099	497	3,887	715
IV Injection Sets	Each	30,317	5,511	24,806	0
IV Solutions	Liter	56,941	10,888	42,651	3,402
Narcotics (Morph or Equal)	1000 $\frac{1}{2}$ gr.	1,238	325	495	418
Needles, Hypo (Reusable)	Each	365,355	41,946	132,819	190,590
Scissors, Gen. Operating	Each	5,273	631	4,642	0
Syringe, Hypo (Reusable)	Each	86,665	10,601	60,802	15,262
Tetanus Toxoid	cc's	10,986	420	5,537	5,029
Thermometers, Clinical	Each	116,973	19,575	42,539	54,859

Table 17

D. New Orleans

1. Effects of Attack

a. Medical Facilities

The medical facilities under direct consideration in the New Orleans damage assessment include:

- 29 Hospitals (H)
- 2 Convalescent Hospitals (CH)
- 25 Nursing Homes (N)
- 18 Government Medical Administrative Offices (GA)
- 18 Medical Manufacturers (MH)
- 39 Medical Wholesalers (WH)
- 49 Health Supply Facilities (HS)

Each of the above listed facilities is represented schematically on figures 20-26. As can be seen from these figures the facilities of interest are located in or closely centered around the area of weapon impact, consequently the direct effects damage to the medical systems of New Orleans is very extensive.

For purposes of this damage assessment the New Orleans area was divided into the following zones of direct over-pressure and the facilities at risk in each were found to be as follows:

<u>&gt; 28 PSI</u>	<u>Code Numbers</u>
H	1, 2, 5, 7, 8, 10, 11, 12, 13, 15, 17, 18, 26
CH	1, 2

HOSPITALS -- NEW ORLEANS

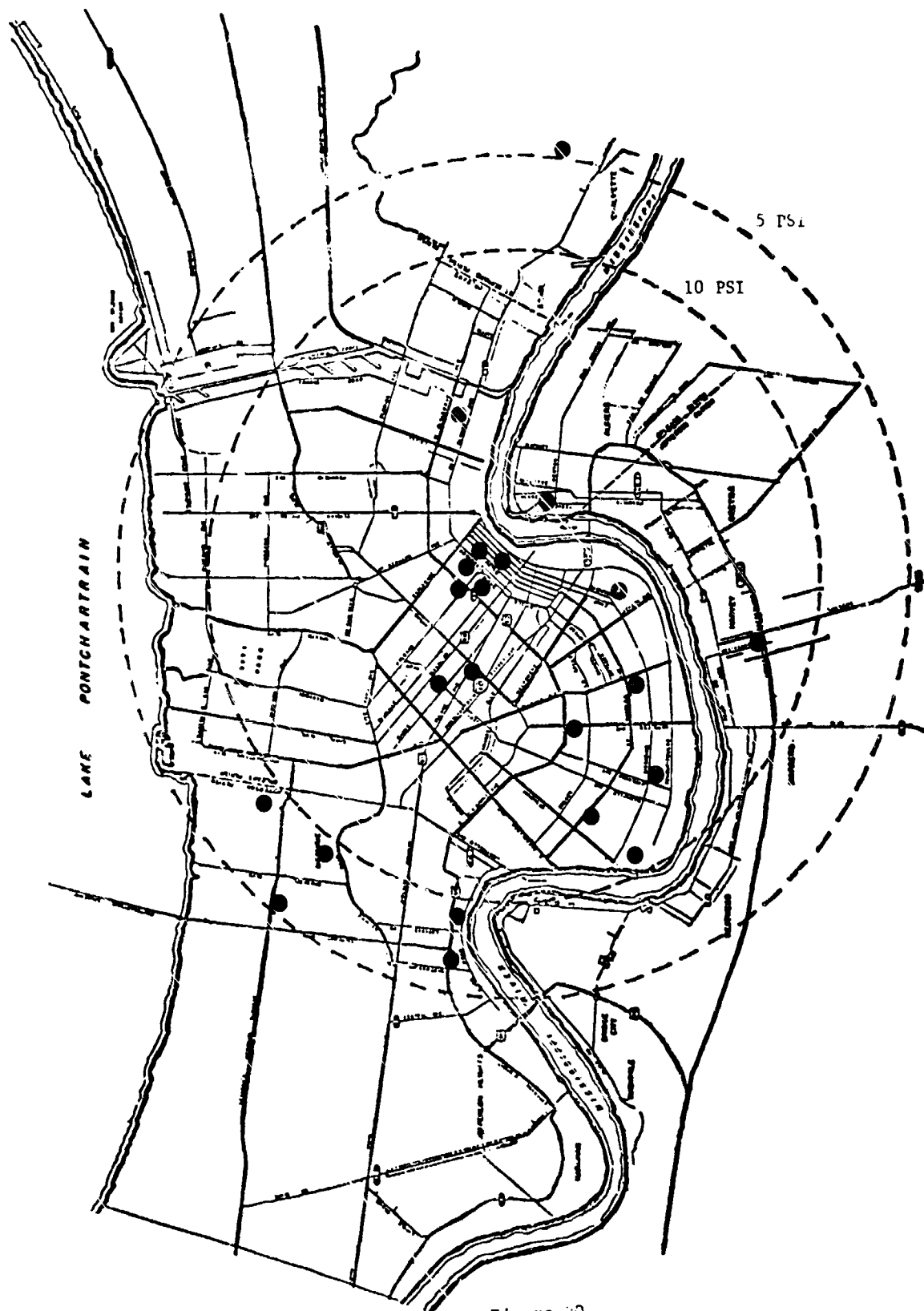


Figure 20

CONVALESCENT HOSPITALS -- NEW ORLEANS

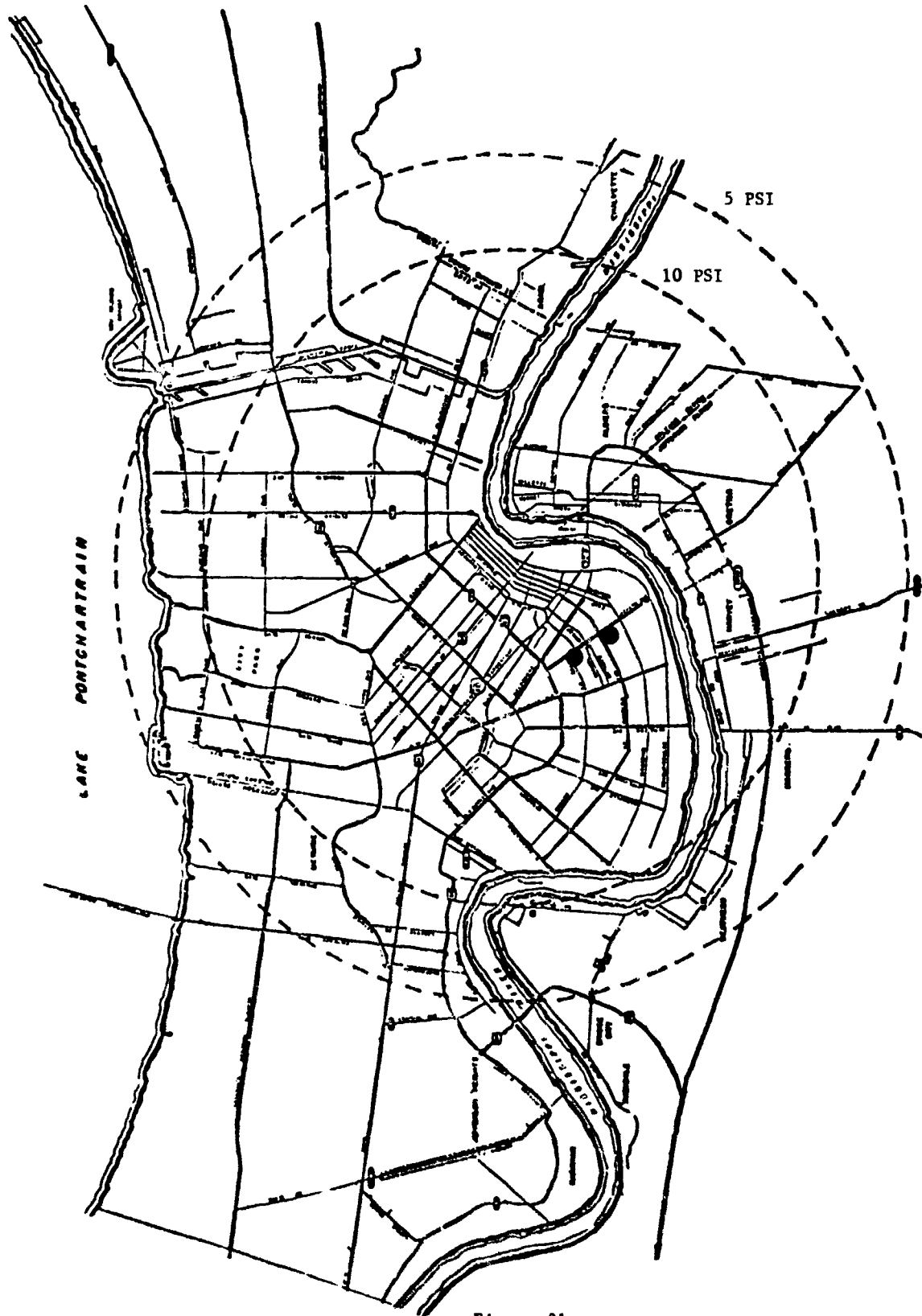


Figure 21

NURSING HOMES -- NEW ORLEANS

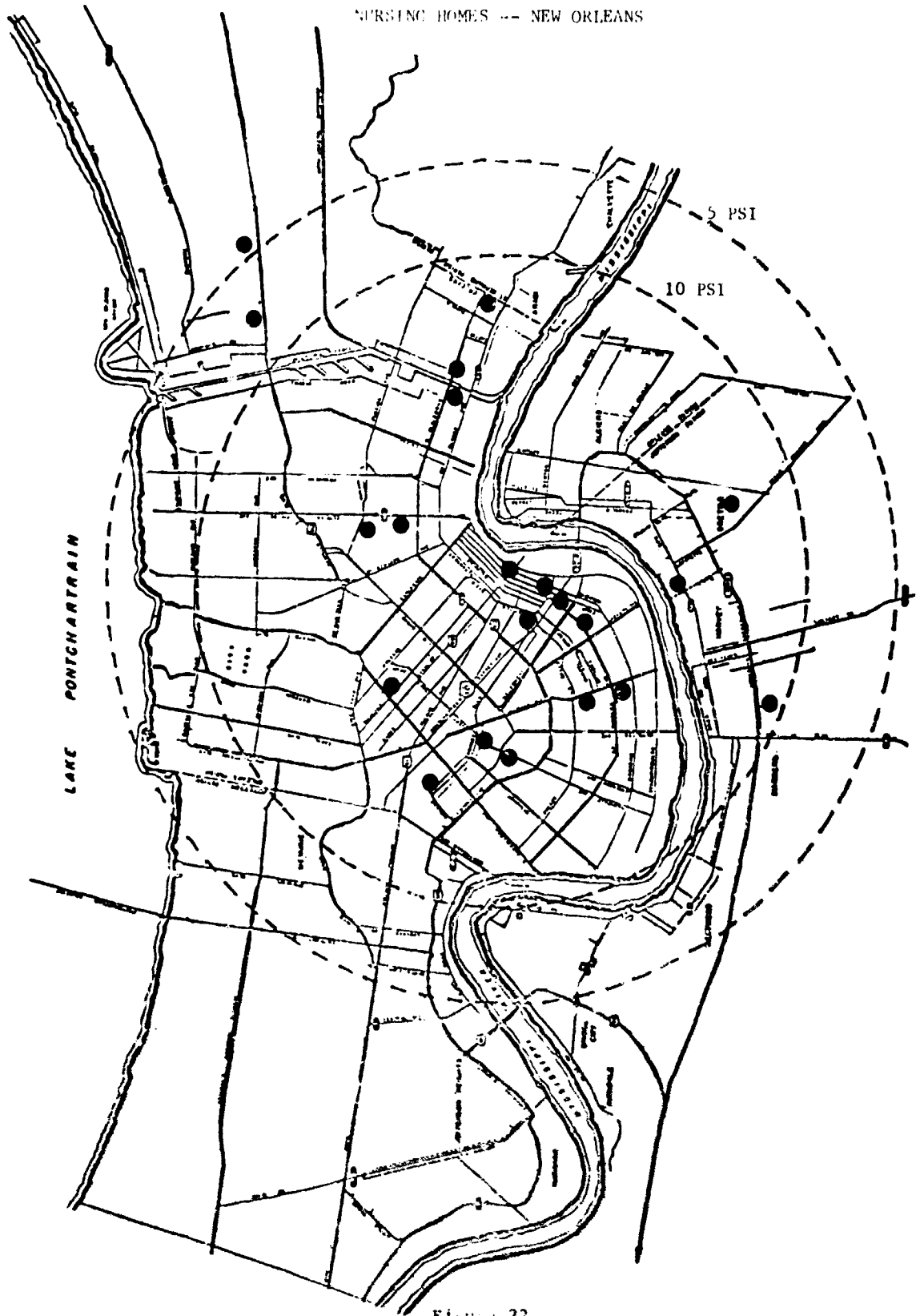
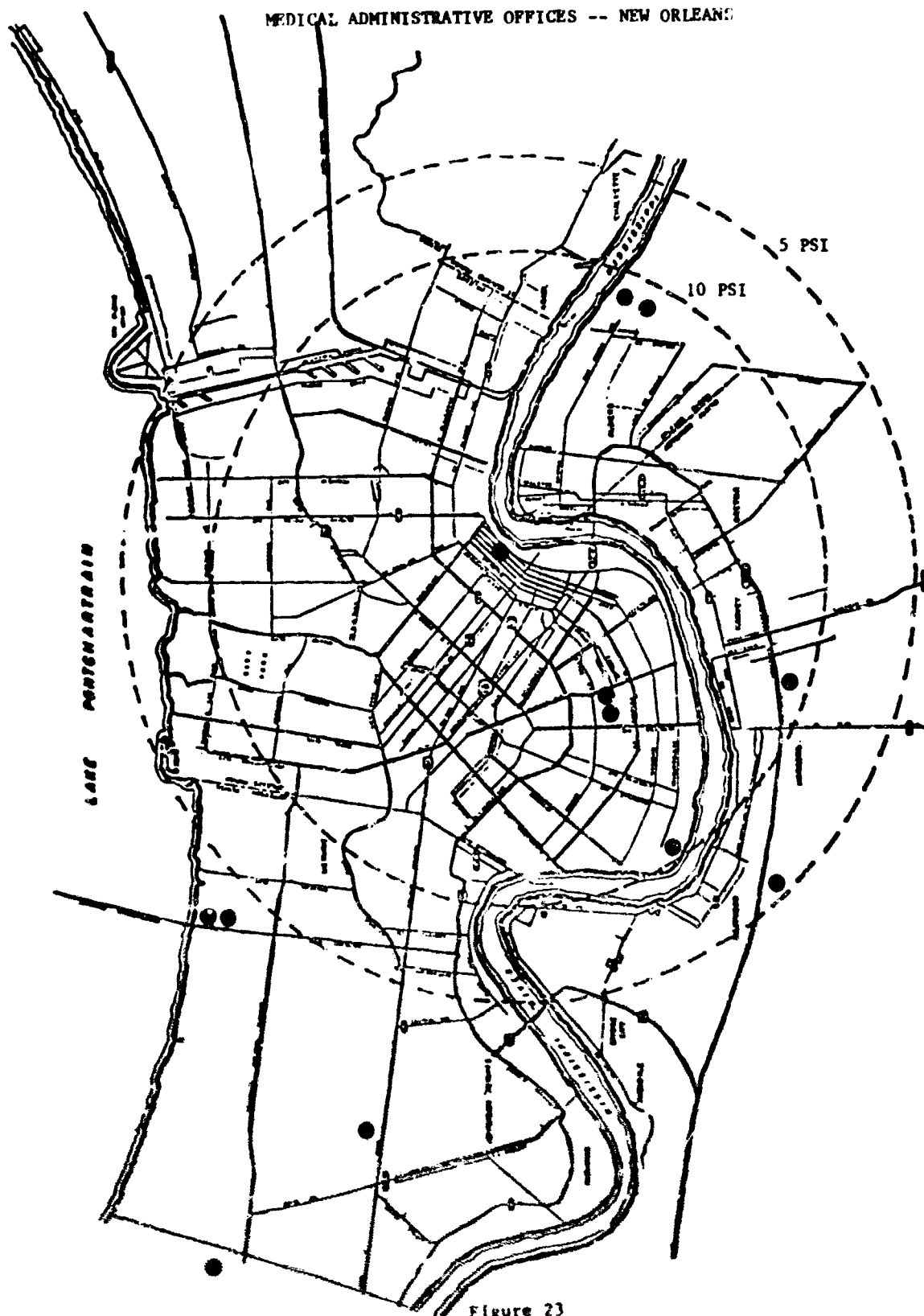


FIGURE 22

MEDICAL ADMINISTRATIVE OFFICES -- NEW ORLEANS





MEDICAL MANUFACTURERS -- NEW ORLEANS

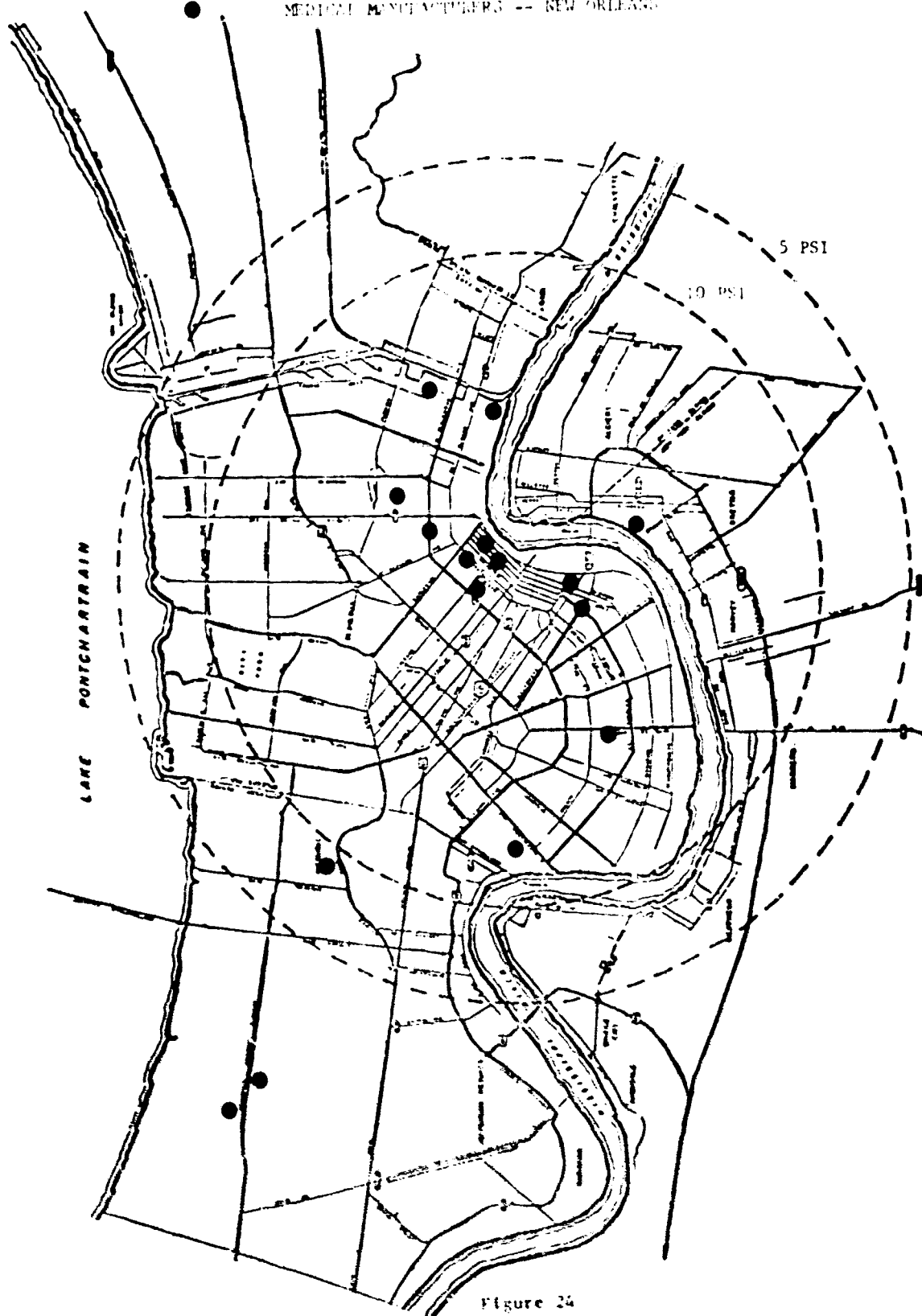


Figure 24

MEDICAL WHOLESALERS - NEW ORLEANS

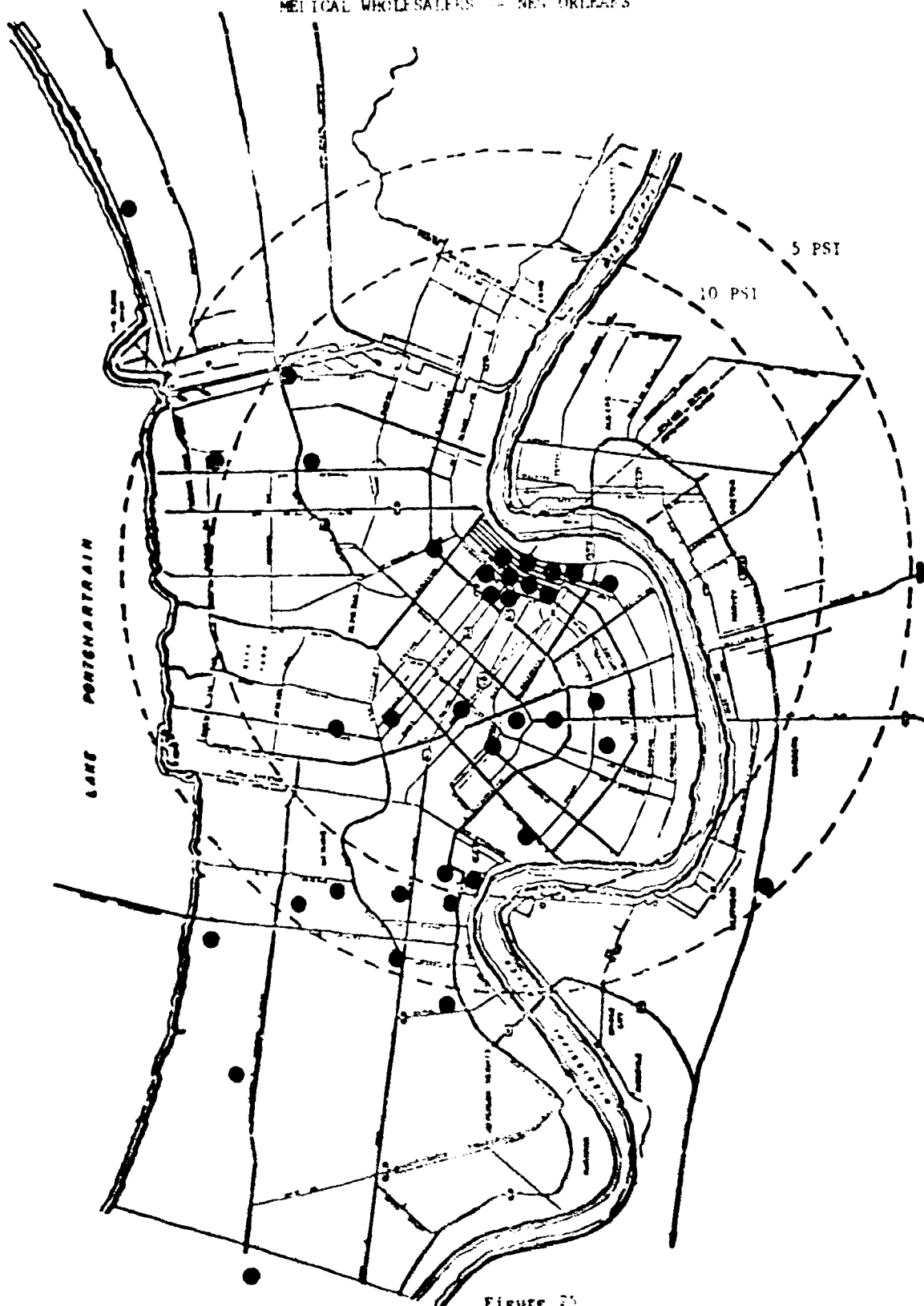


FIGURE 25

A detailed map of New Orleans, Louisiana, illustrating the distribution of health supply facilities and water pressure zones. The map features a grid of streets and major waterways, including Lake Pontchartrain to the west and the Mississippi River to the south. Numerous black dots represent health supply facilities, with a high concentration in the central urban area. Two dashed circular lines indicate water pressure zones, labeled '5 PSI' and '10 PSI'. The map also shows various landmarks and infrastructure, such as the Mississippi River Gulf Outlet and the Lake Pontchartrain Canal.

Figure 26

<u>&gt; 28 PSI</u>	<u>Code Numbers</u>
N	2, 9, 10, 11, 13, 14, 19, 20, 21, 22, 23, 24
GA	1, 2, 7,
MH	1, 2, 4, 7, 8, 12, 13, 14, 16, 17
WH	2, 7, 8, 10, 11, 12, 13, 14, 16, 18, 22, 23, 25, 28, 29, 32, 33, 34
HS	1, 2, 4, 8, 11, 15, 20, 21, 23, 24, 25, 26, 27, 28, 31, 34, 36, 39, 42, 44, 48

<u>17-28 PSI</u>	<u>Code Numbers</u>
N	4, 8
MH	10, 11
WH	5, 17, 19, 35
HS	5, 14, 29, 30, 32, 33, 41, 45

<u>12-17 PSI</u>	<u>Code Numbers</u>
H	4
N	1, 5, 12
GA	4, 5
MH	15
WH	9
HS	13, 16, 37, 46

<u>10-12 PSI</u>	<u>Code Numbers</u>
H	3, 14
N	15, 16
MH	6
HS	10, 22

<u>5-7 PSI</u>	<u>Code Numbers</u>
H	16, 21
N	6, 20
GA	10
WH	30, 31
HS	3, 7, 9, 18

<u>4-5 PSI</u>	<u>Code Numbers</u>
H	19
HS	12, 35

<u>3-4 PSI</u>	<u>Code Numbers</u>
N	18
GA	8, 11
MH	5
WH	3, 4, 6, 20
HS	16, 17, 19

<u>2-3 PSI</u>	<u>Code Numbers</u>
GA	6, 12
MH	3
WH	37

<u>1-2 PSI</u>	<u>Code Numbers</u>
MH	18

<u>&lt; 1 PSI</u>	<u>Code Numbers</u>
H	23, 24, 25, 27, 28, 29
N	3, 17
GA	15, 16, 17, 18, 19
MH	19
WH	38, 39

Table 18 represents a tabular summary by facility category at risk in each of the PSI zones.

The number in parenthesis is the portion surviving the direct blast damage and the underlined number represents that portion which survives both the blast and the fire.

A unique characteristic of New Orleans medical system is the large number of private clinics which are found throughout the study area. These clinic facilities are often of small hospital status and since there are 90 of

NEW ORLEANS

Number of facilities at risk. Portion surviving the direct effects is in parentheses and the portion surviving both the blast and the fire is underlined.

PSI	( > 28 )	( 17-28 )	( 12-17 )	( 10-12 )	( 7-10 )	( 5-7 )	( 4-5 )	( 3-4 )	( 2-3 )	( 1-2 )	( < 1 )	TOTAL
Hospital beds	4911 (0) 0	195 (0) 0	453 (281) 156	711 (525) 294	26 (22) 12	40 (37) 22				604 (604) 604	6940 (1469) 1088	
Hospital beds (Packaged Disaster Hosp)										600 (600) 600	600 (600) 600	
Convalescent Hospitals	2 (0) 0										2 (0) 0	
Nursing Homes	12 (0) 0	2 (0) 0	3 (0) 0	1 (0) 0	2 (.7) .119	2 (1.7) .3		1 (1) .3		2 (2) 2	25 (5.4) 2.6	
Govern. Medical Administrative Offices	3 (0) 0		2 (0) 0	3 (0) 0	1 (.8) 0			2 (2) .6	2 (2) 1.3	5 (5) 5	18 (9) 6.9	
Medical Manufacturers	10 (0) 0	2 (0) 0	1 (0) 0	1 (.45) .2				1 (.96) .03	1 (1) .7	1 (1) 1	18 (4.3) 2.8	
Medical Wholesalers	18 (0) 0	4 (0) 0	1 (0) 0	7 (.7) .119		2 (1.4) .2		4 (3.7) 1.2		2 (2) 2	39 (8.8) 4.2	
Health Supply Facilities	22 (0) 0	8 (0) 0	4 (0) 0	1 (0) 0	2 (.7) .119	4 (3.4) .6	2 (1.8) .6	3 (3) .3			46 (8.9) 1.5	

Table 18

them in the study area, they do represent a substantial medical resource.

In addition, there are 140 retail drug sources (drugstores) which, along with the medical clinics mentioned above, were not plotted on the master working maps.

In the case of San Jose it was felt that the location of the drugstores could be inferred from the location of the pharmacists. This relationship is probably significantly less reliable in New Orleans since the ratio of pharmacists to drugstores is about 5:1 instead of the 2:1 ratio found for San Jose. Obviously in New Orleans a substantial number of the pharmacists are not in drugstores per se. The 90 medical clinics might well account for a large share.

Nevertheless, since there does not appear to be any alternate feasible method of assessing retail damage, the ratio of 5:1 will be used. The number of pharmacists in any given PSI range divided by 5 will be assumed to be the number of drugstores in the same PSI range. Table 19 lists the findings.

The fact that the 90 medical clinics were not specifically considered in this analysis is not as significant as it might appear. It is unlikely that they would be distributed very differently from the other resources

# DRUGSTORES -- NEW ORLEANS

<u>PSI</u>	<u>Pharmacists</u>	<u>Drugstores</u>	<u>Number Surviving</u> <u>Blast</u>	<u>Blast &amp; Fire</u>
15	442	86	0	0
12	124	23	0	0
11	15	3	0	0
7.5	95	19	16	3
5.5	22	4	3.8	1.2
4.5	1	0	0	0
3.5	8	1	1	.3
2.5	20	4	<u>4</u>	<u>2.7</u>
		TOTAL	20.3	7.2

Table 19



and since the destruction is so wide spread there is little reason to assume that their surviving resources would materially alter the post-attack situation.

b. Medical Personnel

The medical and health related personnel at risk in New Orleans area include:

- 2070 Physicians
- 484 Dentists
- 47 Veterinarians
- 727 Pharmacists
- 103 Environmental Health Personnel
- 3132 Registered Nurses

The ZIP Code location of these health personnel and the associated levels of weapons effects for each ZIP Code are given in table 20. Table 21 summarizes the data by weapons effects categories.

Table 22 describes the numbers of casualties by type for each of the PSI Zones. K represents the number killed, SI seriously injured and MI moderately injured.

Since the New Orleans area receives such extensive physical damage from direct blast, fire ignitions and fire spread, as well as extensive flooding of significant portions of the city, it is difficult to imagine the immediate availability of very effective protection from fallout.

# DISTRIBUTION OF HEALTH PERSONNEL -- NEW ORLEANS

<u>ZIP CODES</u>	<u>PSI</u>	<u>ERD.</u>	<u>MD</u>	<u>DDS</u>	<u>DVM</u>	<u>PHARM</u>	<u>EN. HEALTH PERSONNEL</u>	<u>RN</u>
<u>St. Bernard Parish</u>								
70043	4.5	800	6	1		1	3	48
70053	22	5020	24	6		15	2	59
70032	11	1000	5	2	3	6		43
70075	2.5	<500	0					1
70085	2.5	<500	0					4
<u>Jefferson Parish</u>								
70058	15	5000	8	1		4	2	14
70062	2.5	<200	6	3		10	1	56
70072	11	5000	18	5		9	3	27
70002	7.5	800	78	30	11	77	12	518
70094	5.5	10000	7	3		5	1	27
<u>Orleans Parish</u>								
70112	>28	N/A	414	41	2	29	13	83
70113	>28	N/A	32	13	4	29	2	79
70114	12	1000	16	12	0	18	2	81
70115	>28	N/A	503	47	4	77	9	342
70116	>28	N/A	97	135	1	38	3	112
70117	>28	N/A	21	23	1	49	4	92
70118	15	7500	139	34	2	78	10	270
70119	>28	N/A	80	40	5	88	6	237
70121	7.5	1000	110	4	2	18	6	193
70122	12	1000	47	28	3	66	4	272
70123	3.5	600	11	6	1	8	3	135
70124	12	800	24	15	1	40	3	156
70125	>28	N/A	34	20	2	35	7	140
70126	5.5	800	13	7	1	17	5	71
70127	2.5	<600	6	0	0	7	1	40
70128	2.5	<600	0	0	0	0	0	1
70130	>28	N/A	0	0	0	0	0	30
70140	2.5	500	363	7	4	3	0	0

Table 20

# DISTRIBUTION OF HEALTH PERSONNEL -- NEW ORLEANS

<u>PSI</u>	<u>ERD WITH PF OF 10</u>	<u>MD</u>	<u>DDS</u>	<u>VET</u>	<u>PHARM.</u>	<u>EN. HEALTH PERSONNEL</u>	<u>REGISTERED NURSES</u>
15	N/A	1354	360	21	442	58	1458
12	80-100R	87	55	4	124	9	509
11	5COR	18	5	0	9	3	27
	100R	5	2	3	6		43
7.5	80-100R	188	34	13	95	18	711
5.5	1000R	7	3	0	5	1	27
	80R	13	7	1	17	5	71
4.5	80R	6	1	0	1	3	48
3.5	60R	11	6	1	8	3	135
2.5	20-60R	375	9	4	20	2	102

Table 21

PERSONNEL CASUALTIES -- NEW ORLEANS

PSI	PHYSICIANS			DENTISTS			VETERINARIANS			PHARMACISTS			EN. HEALTH PERSONNEL			REGISTERED NURSES		
	K	SI	MI	K	SI	MI	K	SI	MI	K	SI	MI	K	SI	MI	K	SI	MI
15 1354				360			21			442			58			1458		
123 56	4	17		41	3	11	2	2	0	96	5	23	6	2	1	392	20	97
117 500R 12	1	5		3	1	1	0	0	0	6	1	2	1	1	0	17	2	8
100R 3	1	1		1	0	1	2	1	0	4	1	1	0	0	0	28	3	12
7.5/ 90R 22	22	122		4	4	22	1	2	8	11	11	62	2	2	12	85	85	462
5.3/ 1000R 1	1	5			1	2	0	0	0	1	1	3	0	1	0	1	3	18
80R 1	1	8		1	1	5	0	1	0	1	2	11	0	1	3	3	8	47
4.5/ 80R 0	1	2		0	0	1	0	0	0	0	0	1	0	0	2	1	5	19
3.5 60R 0	1	6		0	1	3	0	0	1	0	1	4	0	0	1	1	11	69
2.5/ 40R 0	19	135		0	1	3	0	0	1	0	1	7	0	0	1	0	5	37
Sub-Total 1459	51	301		410	12	49	26	6	10	561	23	114	67	7	20	1986	142	769
Blast Casualties																		
TOTAL 1471	49	291		415	10	46	26	6	10	568	21	109	69	5	20	2017	137	743
Including radiation mortality																		
UNINJURED SURVIVORS	259			13			5			29			9					235

Table 22

For purposes of this analysis a PF of 10 is given to all survivors of the direct blast effects. The radiation levels of tables 20 and 21 represent the exposure dose ERD assuming a PF of 10.

All those individuals with an ERD below 100R are not considered as casualties. There are only two groups of blast survivors whose ERD is above 100R.

The ERD for these two groups is 500R in one case and 1000R in the other. Under the circumstances it is reasonable to assume 100% mortality for both these groups. Therefore in the total column of table 22 the deaths added because of radiations are accounted for.

## 2. Conclusion

The uninjured medical personnel include:

	<u>% of Pre-attack levels</u>
189 Physicians	12
13 Dentists	3
5 Veterinarians	10
2 Pharmacists	4
9 Environmental Health Personnel	9
235 Registered Nurses	7

This group could be augmented by the moderately injured individuals within a period of a few days but even so the medical system would be unable to deliver even basic minimum emergency service for quite some time post-attack.

The amount of medical resources which survive the attack, by indicator items, are given in Table 1.

Since the fallout radiation would preclude the immediate deployment of medical care services it must be concluded that the entire New Orleans area would be without even emergency medical service for a period of several days post-attack and that medical services would be at a minimum for a considerable time thereafter.

The medical system in the New Orleans area is virtually knocked out by the attack in question. The resources which do survive are obviously inadequate to respond in any meaningful manner.

Since the resource depletion is so extensive, the New Orleans area would have to rely on considerable outside assistance to institute even a basic minimum of emergency medical care services.

QUANTITIES SURVIVING -- NEW ORLEANS

<u>Item</u>	<u>Unit of Measure</u>	<u>Total</u> <sup>*</sup>	<u>Whole-Sale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	342	22	306	14
Antibiotics, Broad Spec.	gm.	13,867	4,628	5,653	3,586
Antibiotics, Penicillin	Mill. U.	12,970	4,081	5,999	2,890
Aspirin	lb.	517	165	45	307
Bandage, Gauze, Roller	Sq. Yd.	2,998	500	1,950	548
Digitalis & Derivatives	1000 USP U.	61	25	19	19
Gauze Pads (Sponges)	1000's	225	26	193	6
IV Injection Sets	Each	1,481	256	1,225	0
IV Solutions	Liter	2,631	390	2,114	127
Narcotics (Morph or Equal)	1000 $\frac{1}{2}$ gr.	109	24	23	62
Needles, Hypo (Reusable)	Each	9,219	364	6,581	2,274
Scissors, Gen. Operating	Each	273	43	230	0
Syringe, Hypo (Reusable)	Each	3,669	476	3,011	182
Tetanus Toxoid	cc's	475	112	274	89
Thermometers, Clinical	Each	3,531	806	2,106	619

\* Available to Community (Post-Attack)

Table 23

E. Providence

1. Effects of Attack

a. Medical Facilities

The medical facilities under direct consideration in the Providence damage assessment include:

- 26 Hospitals (H)
- 63 Nursing Homes (N)
- 11 Government Medical Administrative Offices (GA)
- 23 Medical Manufacturers (MH)
- 13 Medical Wholesalers (WH)
- 19 Health Supply Facilities (HS)

Each of the above listed facilities is represented schematically on figures 27-32.

The direct effects damage to the Providence area from blast and fire is for all practical purposes non-existent. Consequently, the medical supplies and facilities remain at the pre-attack level. The only significant damage to medical supplies as such would be the clouding of medical X-Ray film. Since less than 100 MR can render X-Ray film useless for medical diagnostic applications a near total loss for this particular item must be assumed.

b. Medical Personnel

The Providence metropolitan area under consideration in this study includes 568,575 people from:



# HOSPITALS -- PROVIDENCE

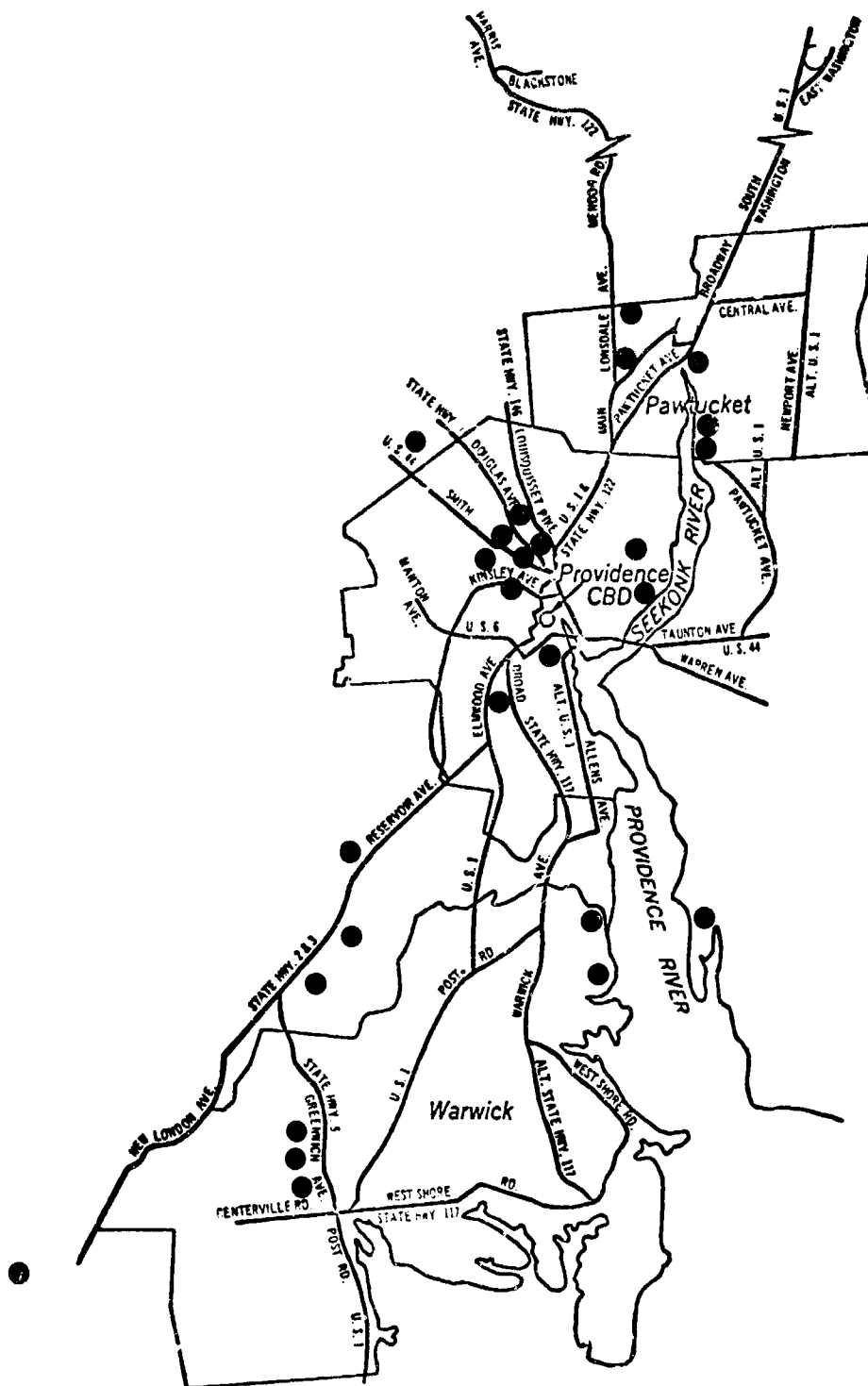


Figure 27

NURSING HOMES -- PROVIDENCE

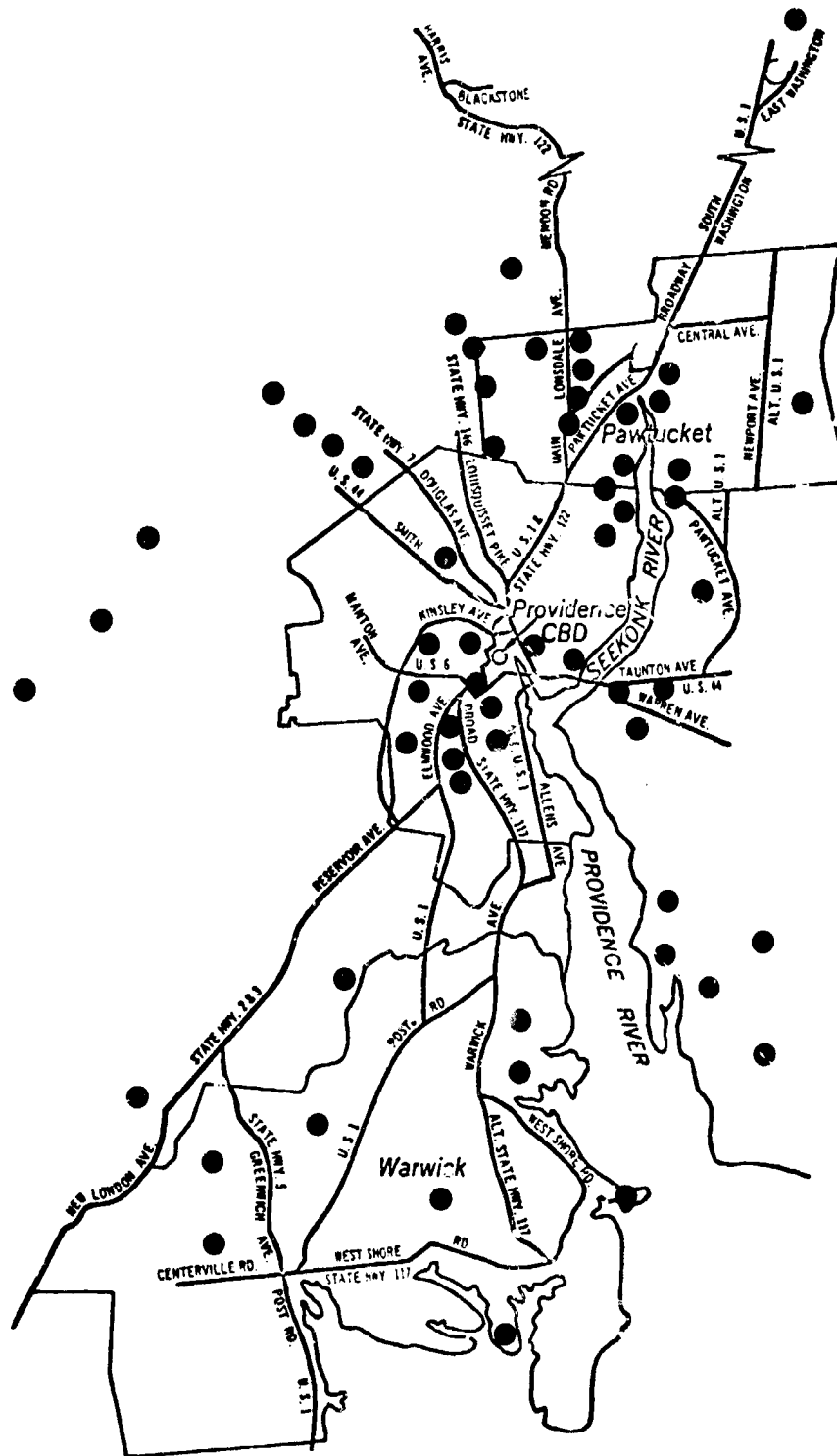


Figure 28

MEDICAL ADMINISTRATIVE OFFICES -- PROVIDENCE

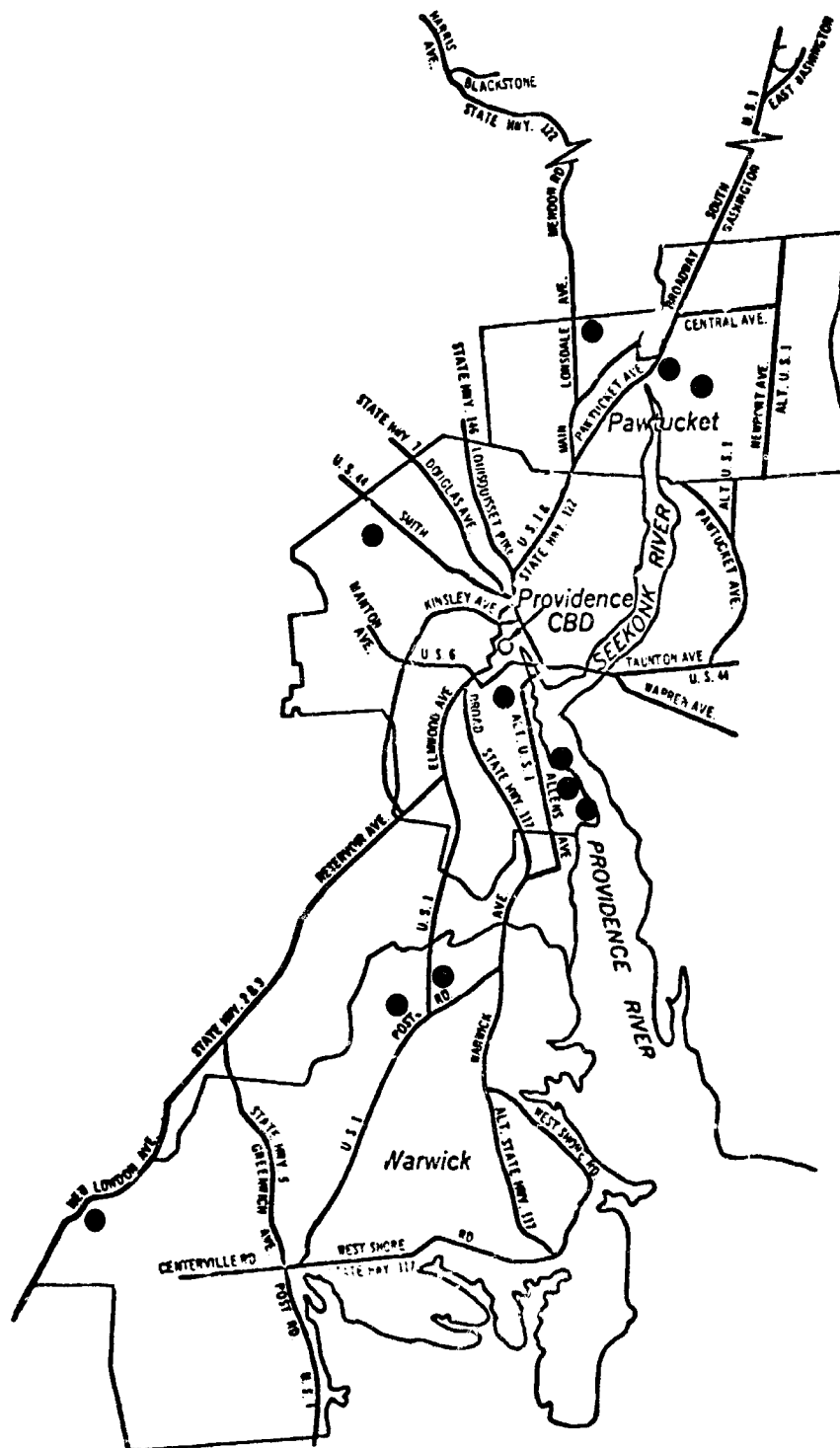


Figure 29

MEDICAL MANUFACTURERS -- PROVIDENCE

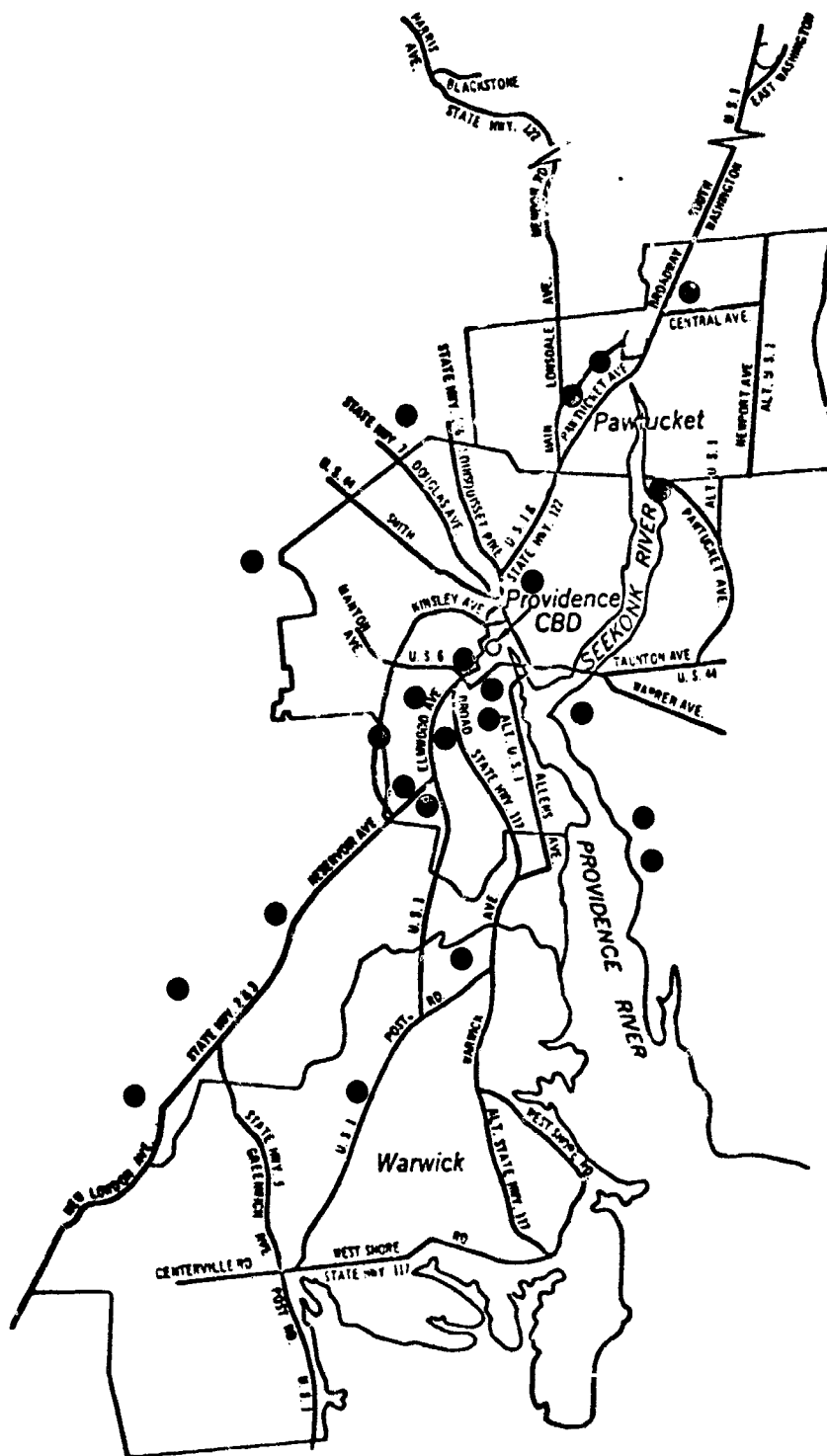


Figure 30

MEDICAL WHOLESALERS -- PROVIDENCE

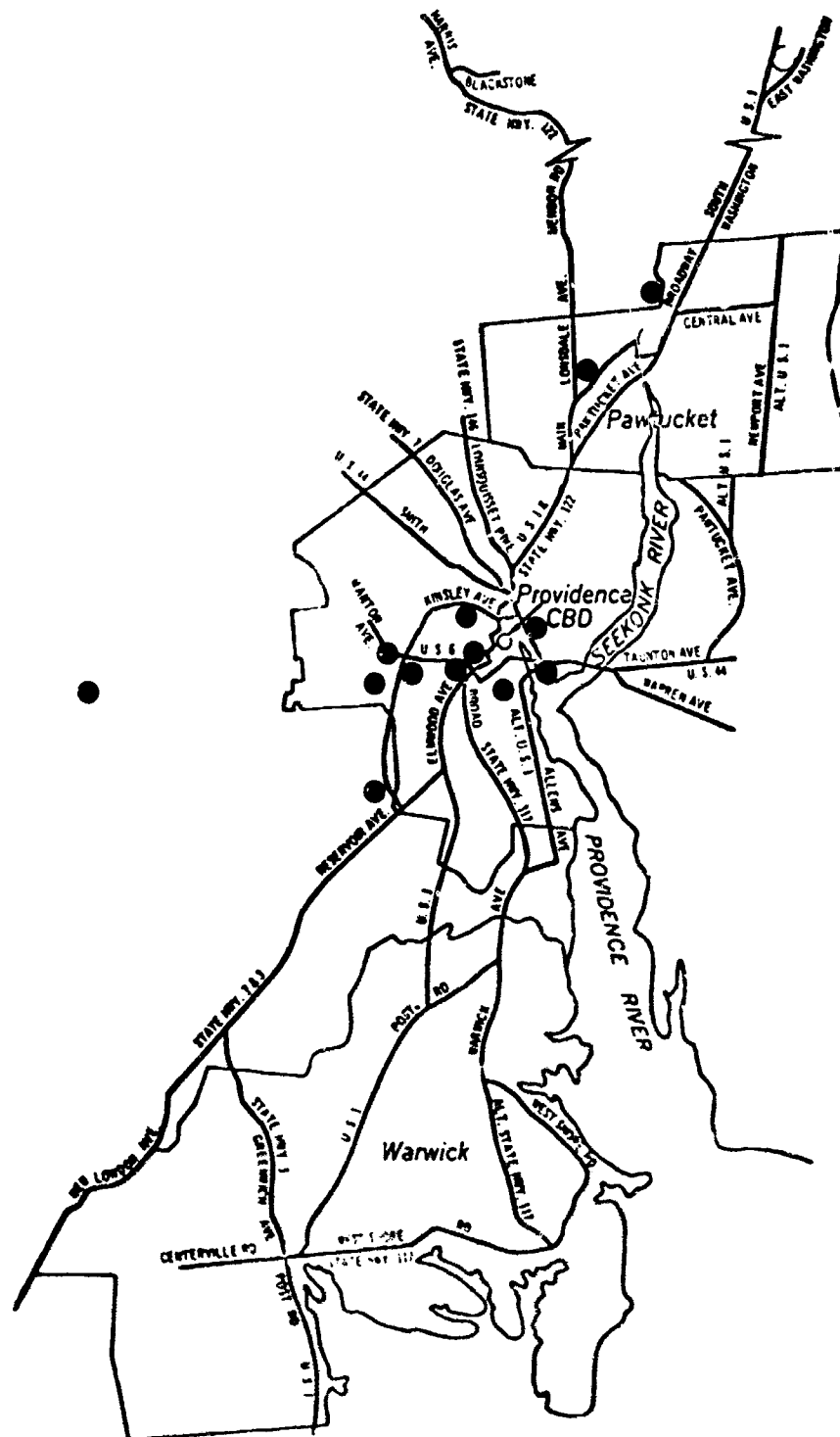


Figure 31

# HEALTH SUPPLY FACILITIES -- PROVIDENCE

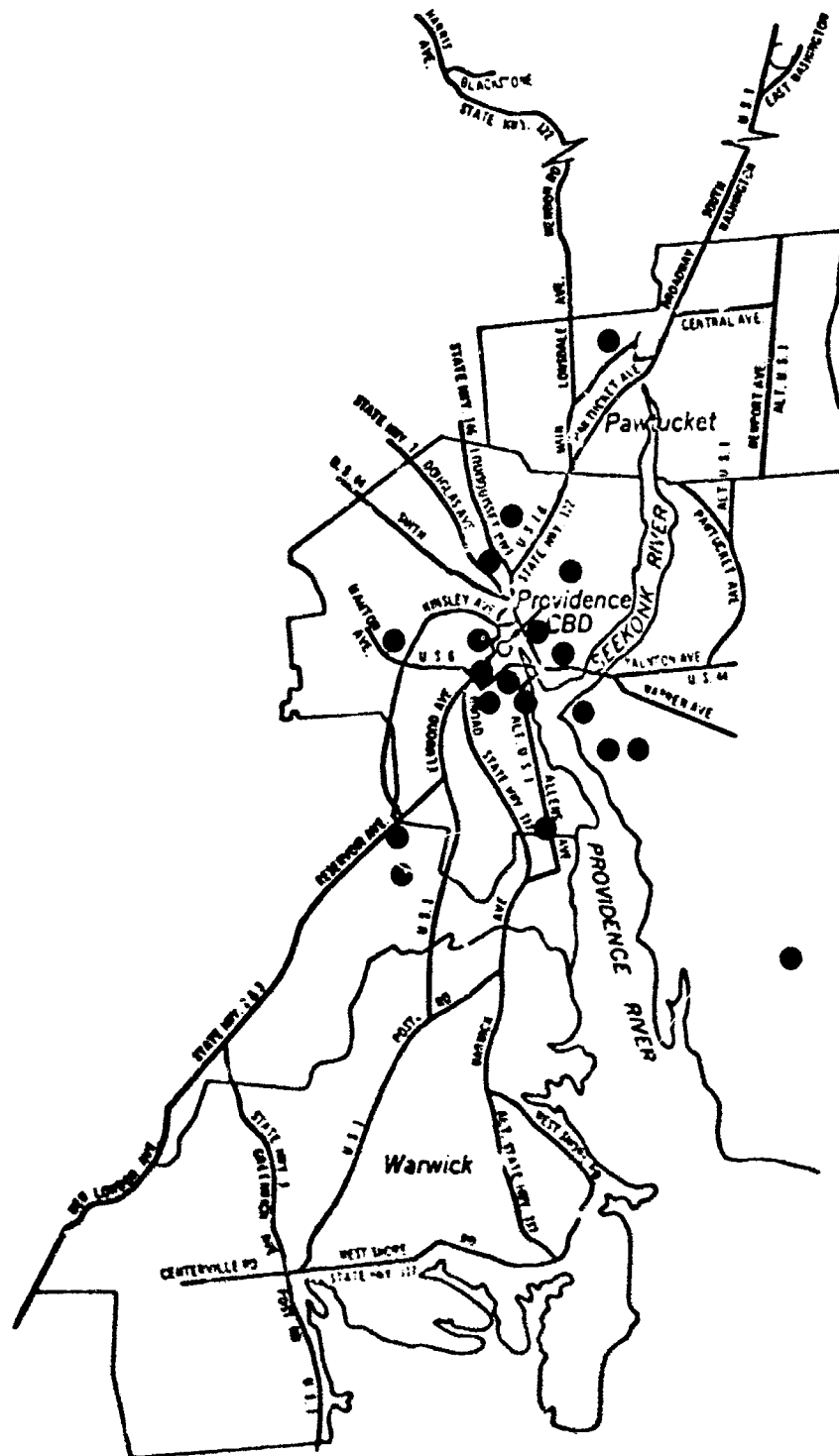


Figure 32

Warwick City	Coventry Town
West Warwick Town	East Providence City
Cranston City	Pawtucket City
Providence City	Johnson Town
North Providence Town	Lincoln Town
North Smithfield Town	Smithfield Town

This area under study includes:

- 987 Physicians
- 337 Dentists
- 17 Veterinarians
- 523 Pharmacists
- 47 Environmental Health Personnel
- 2248 Registered Nurses

The only significant weapons effect problem in the Providence area is the relatively high level of fallout radiation. Figure 33 represents the total unprotected ERD values, predicted on a grid basis across the study area. These high levels of radiation are sufficient to cause a high casualty rate for individuals without adequate shelter. The specific protection factors of the shelters utilized by medical personnel is of course unknown so some assumptions must be made regarding the distribution of personnel and the applicable PF's.

The Providence area has a substantial number of high PF shelter spaces. On the basis of this, for purposes of this analysis, it is assumed that 50% of the medical personnel are sheltered by a PF of 250 or more. The remaining 50% are given a PF of 25 on the assumption that many individuals would be taking shelter either in their home basements or other comparable facilities.

# UNPROTECTED ERD VALUES -- PROVIDENCE

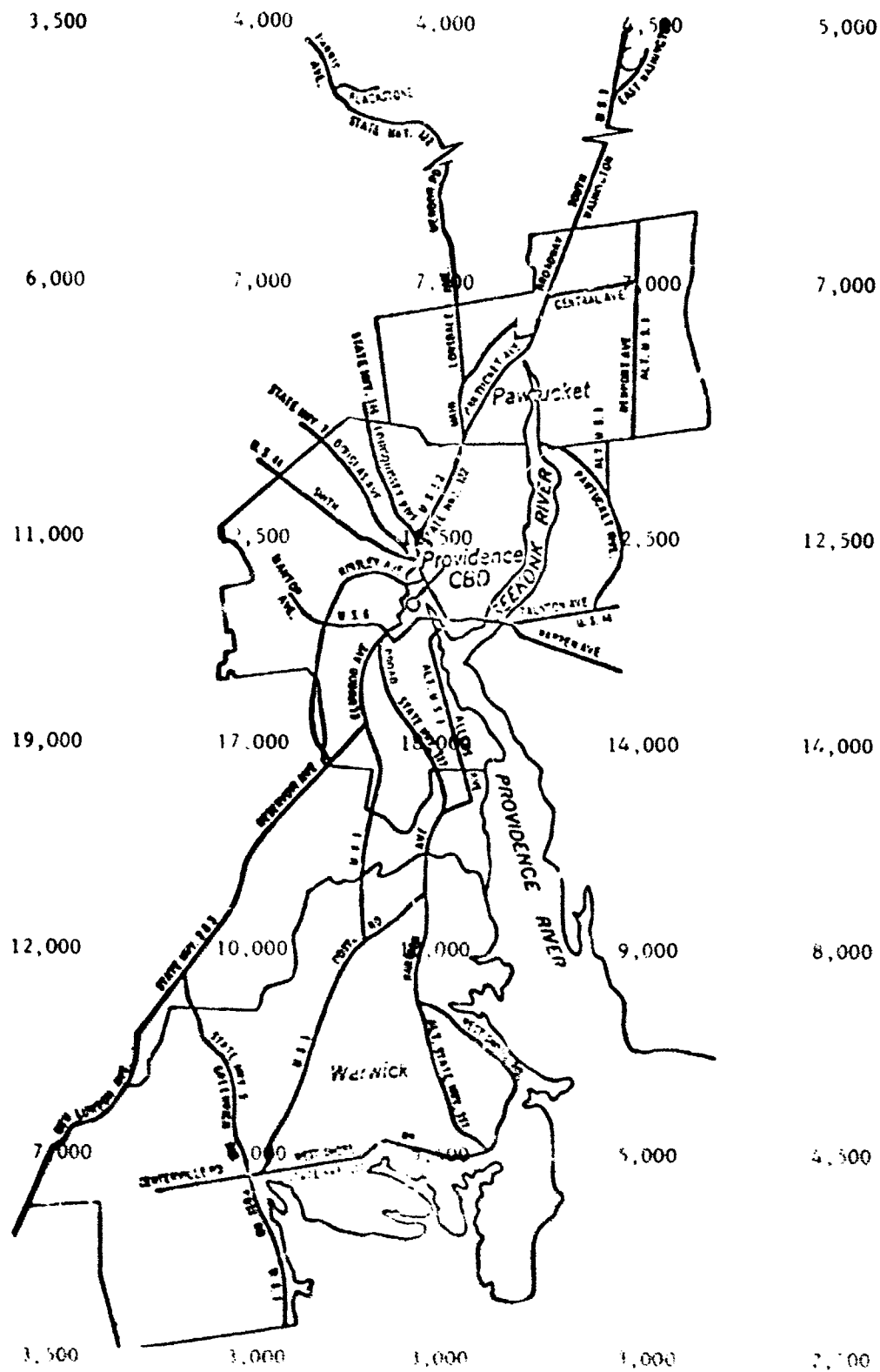


Figure 33



Table 24 lists the number of personnel by ZIP Codes and the total unprotected ERD values associated with each ZIP Code. Table 25 summarizes the information.

On the basis of the assumed PF's 250 and 25 for 50% of the population respectively table 26 lists the casualties expected at the various ERD levels. The K represents those who will die within a period of 2-6 weeks. The I represents all levels of radiation injury excluding mortality and the UI represents the uninjured survivors.

The injury and mortality predictions are based on reference 9.

The casualty prediction for the Providence area is obviously very sensitive to the assumed PF. If for example one assumed a minimum PF of 100 for all personnel, there would be almost no mortality and very little injury.

The casualties listed in table 26 are based on the assumption that no medical care is given. The mortality rate could be reduced by medical care. It is reasonable to suppose (reference 10) that with fairly good control of the environment and with an adequate supply of water the mortality among persons receiving a radiation exposure otherwise lethal to

# HEALTH PERSONNEL DISTRIBUTION -- PROVIDENCE

<u>ZIP CODE</u>	<u>MD</u>	<u>DDS</u>	<u>DVM</u>	<u>PHARM.</u>	<u>EN. HEALTH PERSONNEL</u>	<u>REGISTERED NURSES</u>	<u>OUTSIDE ERD RADIATION</u>
<u>KENT COUNTY</u>							
02816	3	1	0	6	0	31	7,000R
02886	64	21	3	60	1	336	5,000R
02893	26	17	1	19	2	75	7,000R
<u>PROVIDENCE COUNTY</u>							
02860	112	64	3	133	4	463	7,000R
<u>PROVIDENCE</u>							
02901	64	0	1	1	0	1	18,000R
02902	80	0	0	0	1	0	18,000R
02903	46	78	0	23	11	20	18,000R
02904	9	8	1	21	2	62	12,000R
02905	43	15	2	42	3	134	10,000R
02906	317	58	0	49	4	185	12,500R
02907	45	22	0	42	1	126	17,000R
02908	82	18	0	52	4	273	12,500R
02909	57	29	0	60	8	124	17,000R
02910	23	23	1	40	4	265	10,000R
02911	7	7	0	18	3	81	12,000R
02912	3	0	0	0	0	0	18,000R
02914	9	11	3	11	0	146	14,000R
02915	13	6	1	15	0	93	9,000R
02916	4	1	1	11	1	59	12,500R
02917	1	0	0	1	2	27	7,000R
02919	0	0	0	0	0	16	12,000R

Table 24

# HEALTH PERSONNEL DISTRIBUTION -- PROVIDENCE

Outside ERD	Number of People					
	<u>MD</u>	<u>DDS</u>	<u>DVM</u>	<u>PHARM.</u>	<u>EN. HEALTH</u>	<u>RN</u>
5500R	64	21	3	60	1	336
7000R	142	82	4	159	8	596
9000R	13	6	1	15	0	93
10000R	68	38	3	82	7	399
12000R	98	33	1	91	9	432
12500R	321	59	1	60	5	244
14000R	9	11	3	11	0	146
17000R	102	51	0	102	9	250
18000R	193	78	1	24	12	21

Table 25

MORTALITY AND INJURY DISTRIBUTION -- PROVIDENCE

EXPOSURE DOSE ERD	MD			DDS			DVM			PHARM.			EN. HEALTH PERSONNEL			REGISTERED NURSES		
	K	I	UI	K	I	UI	K	I	UI	K	I	UI	K	I	UI	F	I	UI
72R	0	0	555	0	0	190	0	0	11	0	0	303	0	0	28	0	0	1259
220R	3	21	8	1	7	3	0	0	1	1	19	9	0	0	0	8	109	51
360R	2	4	0	1	2	0	0	0	0	2	5	0	0	0	0	11	25	0
400R	12	22	0	6	13	0	0	1	0	14	27	0	1	2	0	69	160	0
480R	27	22	0	9	7	0	0	0	0	25	20	0	2	2	0	119	97	0
500R	104	56	0	19	10	0	0	0	0	19	11	0	0	2	0	79	43	0
560R	3	1	0	4	1	0	1	0	0	4	1	0	0	0	0	58	15	0
680R	48	3	0	24	1	0	0	0	0	48	3	0	4	0	0	119	6	0
720R	94	2	0	38	1	0	0	0	0	11	1	0	5	1	0	9	1	0
TOTALS	293	131	563	102	42	193	1	1	15	124	87	312	12	7	28	472	466	1310

Table 26

50% or less of the population could be at least halved if two or three antibiotics were available.

## 2. Conclusion

The uninjured medical personnel include:

- 563 Physicians
- 193 Dentists
- 15 Veterinarians
- 312 Pharmacists
- 28 Environmental Health Personnel
- 1310 Nurses

All medical supplies and facilities except X-Ray film survive the attack.

The level of fallout radiation would preclude movement about the city and in a sense pin-down the population. The major medical problem would be the management of radiation sickness.

Contrary to a widely-held misconception, medical care can indeed influence the ultimate survival of individuals exposed to radiation. The exposure level at which medical care might influence survival is in the approximate range of the LD50-30 for any given species. The point in time when application of the medical care is most critical is two to three weeks after exposure. From a Civil Defense point of view this particular fact is very significant since it is just at this time that people pinned down by heavy levels of fallout radiation would be emerging from shelters and therefore would be

able to seek and receive appropriate medical services.

In the context of this study, medical care could substantially reduce the death rate of all those listed on table 26 whose ERD is 560R or below. As fallout radiation permitted, the surviving medical personnel and resources in the Providence area would be adequate to maintain medical care services at essentially normal pre-attack levels.

V. SUMMARY

This study is an assessment of the damage from a specific nuclear attack to the medical resources (personnel as well as facilities and supplies) of the following five U.S. cities:

1. San Jose, California
2. Albuquerque, New Mexico
3. Detroit, Michigan
4. New Orleans, Louisiana
5. Providence, Rhode Island

The surviving resources were found to be as follows on the Summary Table.

It was concluded that all the cities under study, with the exception of New Orleans would be able to organize and deploy at least a basic minimum of emergency medical care services. The damage in New Orleans was regarded as extensive enough to preclude a meaningful emergency medical care service.

SUMMARY TABLE

	<u>PROVIDENCE</u>	<u>SAN JOSE</u>	<u>DETROIT</u>	<u>ALBUQUERQUE</u>	<u>NEW ORLEANS</u>
<u>% Survival of</u>					
Government Medical Adm. Offices	100	61	41	36	37
Wholesale Medical Resources	100	56	52	38	8
Hospital Resources	100	79	76	27	14
Retail Medical Resources	100	65	67	28	5
Packaged Disaster Hospital Resources	100	83	97	51	100
<u>% Uninjured Personnel</u>					
MD	57	52	50	23	12
DDS	57	57	47	38	3
DVM	88	55	56	36	10
Pharmacists	59	61	49	38	4
En. Health Personnel	59	62	54	39	9
Registered Nurses	58	55	53	22	7



SUMMARY TABLE

<u>% Survival of</u>	<u>PROVIDENCE</u>	<u>SAN JOSE</u>	<u>DETROIT</u>	<u>ALBUQUERQUE</u>	<u>NEW ORLEANS</u>
Government Medical Adm. Offices	100	61	41	36	37
Wholesale Medical Resources	100	56	52	38	8
Hospital Resources	100	79	76	27	14
Retail Medical Resources	100	65	67	28	5
Packaged Disaster Hospital Resources	100	83	97	51	100
<u>% Uninjured Personnel</u>					
MD	57	52	50	23	12
DDS	57	57	47	38	3
DVM	88	55	56	36	10
Pharmacists	59	61	49	38	4
En. Health Personnel	59	62	54	39	9
Registered Nurses	58	55	53	22	7

## APPENDIX A

### Working Data

PRE-ATTACK INVENTORIES OF SELECTED MEDICAL ITEMS

Quantity per 1000 Population

CALIFORNIA

<u>Item</u>	<u>Unit of Measure</u>	<u>Wholesale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	0.17	1.87	0.57
Antibiotics, Broad Spec.	gm.	32.85	34.51	111.77
Antibiotics, Penicillin	Mill. U.	36.91	36.56	221.47
Aspirin	lb.	2.22	0.28	9.59
Bandage, Gauze, Roller	Sq. Yd.	8.90	11.89	21.02
Digitalis & Derivatives	1000 USP U.	0.20	0.11	0.65
Gauze Pads (Sponges)	1000's	0.30	1.18	0.30
IV Injection Sets	Each	0.51	7.50	0
IV Solutions	Liter	0.41	12.90	5.44
Narcotics (Morph. or Equal)	1000 $\frac{1}{2}$ gr.	0.24	0.14	2.37
Needles, Hypo (Reusable)	Each	27.00	40.15	102.93
Scissors, Gen. Operating	Each	0.31	1.41	0
Syringe, Hypo (Reusable)	Each	5.46	18.38	7.68
Tetanus Toxoid	cc's	0.84	1.67	3.75
Thermometers, Clinical	Each	4.04	12.86	22.06

Table A-1

PRE-ATTACK INVENTORIES OF SELECTED MEDICAL ITEMS

Quantity per 1000 Population

NEW MEXICO

<u>Item</u>	<u>Unit of Measure</u>	<u>Wholesale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	0.16	2.08	0.52
Antibiotics, Broad Spec.	gm.	41.62	38.20	102.74
Antibiotics, Penicillin	Mill. U.	26.23	39.91	204.11
Aspirin	lb.	1.68	0.31	8.81
Bandage, Gauze, Roller	Sq. Yd.	2.74	13.23	19.27
Digitalis & Derivatives	1000 USP U.	0.21	0.12	0.60
Gauze Pads (Sponges)	1000's	0.09	1.30	0.28
IV Injection Sets	Each	0	8.32	0
IV Solutions	Liter	0	14.25	5.02
Narcotics (Morph. or Equal)	1000 $\frac{1}{2}$ gr.	0.26	0.16	2.18
Needles, Hypo (Reusable)	Each	8.44	44.47	94.64
Scissors, Gen. Operating	Each	0	1.56	0
Syringe, Hypo (Reusable)	Each	0.34	20.41	7.07
Tetanus Toxoid	cc's	0.71	1.86	3.44
Thermometers, Clinical	Each	2.28	14.25	20.30

Table A-2

# PRE-ATTACK INVENTORIES OF SELECTED MEDICAL ITEMS

Quantity per 1000 Population

## MICHIGAN

<u>Item</u>	<u>Unit of Measure</u>	<u>Wholesale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	0.14	2.22	0.42
Antibiotics, Broad Spec.	gm.	33.61	40.82	124.40
Antibiotics, Penicillin	Mill. U.	23.68	43.24	143.10
Aspirin	lb.	4.29	0.33	23.89
Bandage, Gauze, Roller	Sq. Yd.	3.72	14.06	24.13
Digitalis & Derivatives	1000 USP U.	0.13	0.13	0.69
Gauze Pads (Sponges)	1000's	0.26	1.39	0.29
IV Injection Sets	Each	2.38	8.87	0
IV Solutions	Liter	5.69	15.25	1.38
Narcotics (Morph. or Equal)	1000 $\frac{1}{2}$ gr.	0.17	0.17	1.56
Needles, Hypo (Reusable)	Each	21.92	47.49	77.30
Scissors, Gen. Operating	Each	0.33	1.66	0
Syringe, Hypo (Reusable)	Each	5.54	21.74	6.19
Tetanus Toxoid	cc's	0.22	1.98	2.04
Thermometers, Clinical	Each	10.23	15.21	22.25

Table A-3

# PRE-ATTACK INVENTORIES OF SELECTED MEDICAL ITEMS

Quantity per 1000 Population

## LOUISIANA

<u>Item</u>	<u>Unit of Measure</u>	<u>Wholesale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	0.31	2.27	0.31
Antibiotics, Broad Spec.	gm.	62.72	41.88	78.13
Antibiotics, Penicillin	Mill. U.	55.31	44.44	62.96
Aspirin	lb.	2.24	0.34	6.71
Bandage, Gauze, Roller	Sq. Yd.	6.78	14.45	11.96
Digitalis & Derivatives	1000 USP U.	0.35	0.13	0.42
Gauze Pads (Sponges)	1000's	0.36	1.43	0.14
IV Injection Sets	Each	3.48	9.08	0
IV Solutions	Liter	16.40	15.66	2.78
Narcotics (Morph. or Equal)	1000 $\frac{1}{2}$ gr.	0.33	0.17	1.35
Needles, Hypo (Reusable)	Each	38.27	48.75	49.55
Scissors, Gen. Operating	Each	0.59	1.71	0
Syringe, Hypo (Reusable)	Each	6.46	22.31	3.96
Tetanus Toxoid	cc's	1.53	2.03	1.94
Thermometers, Clinical	Each	10.93	15.60	13.49

Table A-4

# PRE-ATTACK INVENTORIES OF SELECTED MEDICAL ITEMS

Quantity per 1000 Population

## RHODE ISLAND

<u>Item</u>	<u>Unit of Measure</u>	<u>Wholesale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	0.20	2.45	0.50
Antibiotics, Broad Spec.	gm.	16.57	45.02	193.64
Antibiotics, Penicillin	Mill. U.	51.62	48.00	158.46
Aspirin	lb.	4.05	0.37	24.24
Bandage, Gauze, Roller	Sq. Yd.	5.52	15.49	30.13
Digitalis & Derivatives	1000 USP U.	0.15	0.14	0.91
Gauze Pads (Sponges)	1000's	0.30	1.54	0.45
IV Injection Sets	Each	0	9.84	0
IV Solutions	Liter	0	16.81	3.24
Narcotics (Morph. or Equal)	1000 ½ gr.	0.43	0.19	2.67
Needles, Hypo (Reusable)	Each	20.29	52.46	90.76
Scissors, Gen. Operating	Each	0	1.84	0
Syringe, Hypo (Reusable)	Each	1.08	24.01	8.40
Tetanus Toxoid	cc's	0.37	2.18	1.58
Thermometers, Clinical	Each	7.44	16.80	36.37

Table A-5

# PRE-ATTACK INVENTORIES OF SELECTED MEDICAL ITEMS

Quantity per 1000 Population

## SAN JOSE, CALIFORNIA

<u>Item</u>	<u>Unit of Measure</u>	<u>Total</u>	<u>Whole-sale</u>	<u>Whsp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	1,671	109	1,197	365
Antibiotics, Broad Spec.	gm.	114,643	21,024	22,086	71,533
Antibiotics, Penicillin	Mill. U.	188,759	23,622	23,397	141,740
Aspirin	lb.	7,736	1,420	178	6,138
Bandage, Gauze, Roller	Sq. Yd.	26,756	5,696	7,609	13,451
Digitalis & Derivatives	1000 USP U.	614	128	70	416
Gauze Pads (Sponges)	1000's	1,139	192	755	192
IV Injection Sets	Each	5,126	326	4,800	0
IV Solutions	Liter	12,000	262	8,256	3,482
Narcotics (Morph. or Equal) 1000 $\frac{1}{2}$ gr.		1,761	154	90	1,517
Needles, Hypo (Reusable)	Each	108,850	17,280	25,696	65,874
Scissors, Gen. Operating	Each	1,099	198	901	0
Syringe, Hypo (Reusable)	Each	20,171	3,494	11,763	4,914
Tetanus Toxoid	cc's	4,006	537	1,069	2,400
Thermometers, Clinical	Each	25,088	2,586	8,230	14,272

Table A-6



# PRE-ATTACK INVENTORIES OF SELECTED MEDICAL ITEMS

Quantity per 1000 Population

## ALBUQUERQUE, NEW MEXICO

<u>Item</u>	<u>Unit of Measure</u>	<u>Total</u>	<u>Whole-sale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	717	42	540	135
Antibiotics, Broad Spec.	gm.	47,464	10,820	9,932	26,712
Antibiotics, Penicillin	Mill. U.	43,463	6,819	10,377	53,069
Aspirin	lb.	2,808	437	81	2,290
Bandage, Gauze, Roller	Sq. Yd.	9,161	712	3,439	5,010
Digitalis & Derivatives	1000 USP U.	242	55	31	156
Gauze Pads (Sponges)	1000's	434	23	338	73
IV Injection Sets	Each	2,163	0	2,163	0
IV Solutions	Liter	5,010	0	3,705	1,305
Narcotics (Morph. or Equal) 1000 $\frac{1}{2}$ gr.		677	68	42	567
Needles, Hypo (Reusable)	Each	38,359	2,193	11,561	24,605
Scissors, Gen. Operating	Each	406	0	406	0
Syringe, Hypo (Reusable)	Each	7,229	87	5,305	1,837
Tetanus Toxoid	cc's	1,562	185	484	893
Thermometers, Clinical	Each	9,576	593	3,705	5,278

Table A-7

PRE-ATTACK INVENTORIES OF SELECTED MEDICAL ITEMS

Quantity per 1000 Population

DETROIT, MICHIGAN

<u>Item</u>	<u>Unit of Measure</u>	<u>Total</u>	<u>Whole-sale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	10,299	515	8,169	1,500
Antibiotics, Broad Spec.	gm.	731,694	123,685	150,217	457,000
Antibiotics, Penicillin	Mill. U.	773,977	88,246	159,123	526,000
Aspirin	lb.	104,916	15,787	1,214	87,000
Bandage, Gauze, Roller	Sq. Yd.	154,227	13,689	51,740	88,000
Digitalis & Derivatives	1000 USP U.	3,495	478	478	2,000
Gauze Pads (Sponges)	1000's	7,138	956	5,115	1,000
IV Injection Sets	Each	43,239	10,598	32,641	0
IV Solutions	Liter	82,137	20,939	56,120	0
Narcotics (Morph. or Equal)	1000 ½ gr.	6,991	625	625	0
Needles, Hypo (Reusable)	Each	539,892	80,665	80,665	284,000
Scissors, Gen. Operating	Each	7,322	1,214	1,214	0
Syringe, Hypo (Reusable)	Each	123,169	20,387	20,387	20,000
Tetanus Toxoid	cc's	15,602	809	809	0
Thermometers, Clinical	Each	175,499	37,646	37,646	80,000

Table A-8

# PRE-ATTACK INVENTORIES OF SELECTED MEDICAL ITEMS

Quantity per 1000 Population

## NEW ORLEANS, LOUISIANA

<u>Item</u>	<u>Unit of Measure</u>	<u>Total</u>	<u>Whole-sale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	2,601	279	2,043	279
Antibiotics, Broad Spec.	gm.	164,457	56,448	37,692	70,317
Antibiotics, Penicillin	Mill. U.	141,457	49,779	39,996	56,682
Aspirin	lb.	8,361	2,016	306	6,039
Bandage, Gauze, Roller	Sq. Yd.	29,871	6,102	13,005	10,764
Digitalis & Derivatives	1000 USP U.	810	315	117	378
Gauze Pads (Sponges)	1000's	1,737	324	1,287	126
IV Injection Sets	Each	11,304	3,132	8,172	0
IV Solutions	Liter	31,356	14,760	14,094	2,502
Narcotics (Morph or Equal)	1000 $\frac{1}{2}$ gr.	1,665	297	153	1,215
Needles, Hypo (Reusable)	Each	122,913	34,443	43,875	44,595
Scissors, Gen. Operating	Each	2,070	531	1,539	0
Syringe, Hypo (Reusable)	Each	29,457	5,814	20,079	3,564
Tetanus Toxoid	cc's	4,950	1,377	1,827	1,746
Thermometers, Clinical	Each	36,018	9,837	14,040	12,141

Table A-9

# PRE-ATTACK INVENTORIES OF SELECTED MEDICAL ITEMS

Quantity per 1000 Population

## PROVIDENCE, RHODE ISLAND

<u>Item</u>	<u>Unit of Measure</u>	<u>Total</u>	<u>Whole-sale</u>	<u>Hosp.</u>	<u>Retail</u>
Anesthetics, Ether	lb.	1,796	114	1,396	285
Antibiotics, Broad Spec.	gm.	145,445	9,444	25,706	40,295
Antibiotics, Penicillin	Mill. U.	147,116	29,423	27,371	90,322
Aspirin	lb.	16,334	2,308	210	13,816
Bandage, Gauze, Roller	Sq. Yd.	29,154	3,151	8,829	17,174
Digitalis & Derivatives	1000 USP U.	683	85	80	518
Gauze Pads (Sponges)	1000's	1,304	171	877	256
IV Injection Sets	Each	5,608	0	5,608	0
IV Solutions	Liter	17,427	0	9,581	1,846
Narcotics (Morph. or Equal) 1000 $\frac{1}{2}$ gr.		1,875	245	108	1,522
Needles, Hypo (Reusable)	Each	93,200	11,565	29,902	51,733
Scissors, Gen. Operating	Each	1,048	0	1,048	0
Syringe, Hypo (Reusable)	Each	19,088	615	13,685	4,788
Tetanus Toxoid	cc's	2,354	211	1,243	900
Thermometers, Clinical	Each	34,546	4,240	9,576	20,730

Table A-10

CASUALTY TABLE

5 MI Air Burst  
Brief

	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19
psf--	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19
Called	0	0	0	0	1	2	4	8	11	20	22	40	23	8	20	21	9	99	100
Severe Injury	0	3	10	13	14	15	15	15	16	13	11	8	7	3	2	1	1	0	0
Moderate Injury	0	32	50	57	64	69	70	66	60	53	45	32	20	12	8	7	1	1	0

Table A-11

CASUALTY TABLE  
5 MT Air Burst  
Non-Seismic Reinforced Concrete

PSI--	1-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24
<sup>1</sup> / <sub>2</sub> Killed	0	0	3	7	11	16	21	25	33	40	50	55
<sup>2</sup> / <sub>3</sub> Severe Injury	0	3	6	8	10	10	12	11	10	9	9	8
<sup>3</sup> / <sub>4</sub> Moderate Injury	5	42	62	67	70	69	63	59	53	47	41	37

Table A-12

# CASUALTY TABLE

5 MT Surface Burst  
Brick

PSI--	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14
% Killed	0	0	0	0	1	2	5	10	20	40	65	88	97	100
% Severe Injury	0	3	9	13	14	15	15	14	13	12	7	2	1	0
% Moderate Injury	4	32	49	55	62	65	64	61	57	48	28	10	2	0

Table A-13

Best Available

CASUALTY TABLE  
5 MT Surface Burst  
Non-Seismic Reinforced Concrete

PSI--	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19
Killed	0	0	0	0	1	3	6	9	12	17	23	29	38	50	70	85	95	98	100
Severe Injury	0	0	2	4	5	7	8	10	11	11	11	10	10	9	6	3	•	0	0
Moderate Injury	3	10	28	46	57	64	68	69	69	68	64	59	50	41	24	12	5	2	0

Table A-1



# CASUALTY TABLE

10 MT Surface Burst  
Brick

PSI--	.5-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
% Killed	0	0	0	0	1	4	8	14	17	50	90	100
% Severe Injury	0	1	8	12	14	15	15	14	13	10	2	0
% Moderate Injury	4	17	44	56	62	65	64	6L	52	40	8	0

Table A-15

Best Available Copy

Best Available Copy

# CASUALTY TABLE

10 MT Surface Burst  
Non-Seismic Reinforced Concrete

PSI-- .5-1 1-2 2-3 3-4 4-5 5-6 6-7 7-8 8-9 9-10 10-11 11-12 12-13 13-14 14-15 15-16 16-17

Killed	0	0	0	1	2	3	7	10	14	20	30	40	70	92	94	100
Severe Injury	0	0	2	4	7	7	6	16	9	22	11	10	6	2	1	1
Moderate Injury	7	11	28	16	61	57	99	76	70	62	7	7	10	1	1	1

Table A-16

APPENDIX B

Medical Facilities

SAN JOSE

HOSPITALS

PALO ALTO

- H-1 Stanford Children's Convalescent Hospital, 520 Willow Road
- H-2 Palo Alto-Stanford Hospital Ctr., 300 Pasteur Drive
- H-3 Vet. Adm. Hosp., 3801 Junipero Serra Blvd.

CAMPBELL-SARATOGA

- H-4 Campbell Community Hospital, 1650 Winchester Blvd.

MOUNTAIN VIEW

- H-6 El Camino Hospital, 2500 Grant Road

LOS GATOS

- H-7 Community Hospital Los Gatos-Saratoga, 815 Pollard Road
- H-8 West Valley General Hospital, 300 De Soto Drive

SANTA CLARA

- H-9 Kaiser Found. Hosp, 900 Kiely Blvd.

SAN JOSE

- H-10 Agnews State Hospital, West Area
- H-11 Alexian Brothers Hospital, 225 N. Jackson Avenue
- H-12 Doctors General Hospital, 976 Lenzen Avenue
- H-13 Good Samaritan Hospital of Santa Clara Valley, 15825 Samaritan Drive
- H-14 O'Connor Hospital, 2105 Forest Avenue
- H-15 San Jose Hospital, 675 E. Santa Clara Street
- H-16 Santa Clara Valley Medical Ctr., 751 S. Bascom Avenue
- H-17 Serra Medical Hsp., 455 O'Connor Drive
- H-18 Alum Rock Hospital-Branch of San Jose Hospital, Crothers Road
- H-19 54096 City Corporation Yard # 1, San Antonio Road (PDH)
- H-20 62682 Basement (E. Wing), City Hall, 1500 Warburton Street (PDH)

SAN JOSE

SAN JOSE (continued)

- H-21 54097 Santa Clara County Fairgrounds (PDH)
- H-22 10-0848 City Warehouse, 340 N. San Pedro (PDH)
- H-23 11-0848 San Jose Hospital, 675 E. Santa Clara St. (PDH)
- H-24 62575 Old City Hall, McKinley & Murphy Streets (PDH)
- H-10 Agnews State Hospital, East Area

RESIDENTIAL HOSPITALS

PALO ALTO-MENLO PARK

- CH-1 Convalescent Hospital - University Branch, 2122 Santa Cruz Avenue
- CH-2 Hill Haven Convalescent Hospital, 16 Coleman Place
- CH-3 Los Altos Sanitarium, 4274 Miranda Avenue
- CH-4 Palo Alto Conv. Hosp. (Ch. of P.A. Med. Res. Found.), 911 Bryant
- CH-5 Grant Convalescent Hospitals, Inc., 3560 LaMata Way
- CH-6 Pleasant Manor Guest Home, 1000 Cowper Palo Alto
- CH-8 Rosedale Guest Home, 1078 Forest Avenue
- CH-9 Sierra Convalescent Centers, 780 Welch Road
- CH-11 Whitcomb Nursing and Convalescent Home, 800 Roble Avenue

LOS ALTOS

- CH-12 Country Rest Home, 1675 Grant Road
- CH-13 Dale Rest Home, 1455 Truman Avenue
- CH-14 Pilgrim Haven Retirement Residence and Health Ctr., 373 Pine Lane
- CH-15 Seven Oaks Rest Home, 1174 Los Altos Avenue
- CH-16 Twelve Acres Inc. (Christian Sc. Home for Children), 610 Twelve Acres Dr.

CAMPBELL-SARATOGA

- CH-17 Arndt Convalescent Hospital, 3333 S. Bascom Avenue
- CH-18 Camden Convalescent Hospital, 1331 Camden Avenue
- CH-19 Chandler Convalescent Hospital, 1190 W. Latimer Avenue
- CH-20 Eldercare Convalescent Hospital, 238 Virginia Avenue
- CH-21 Westmoreland Conv. Hosp. and Rest Home, 18611 Sousa Lane

MOUNTAIN VIEW

- CH-23 Grant-Cuesta Convalescent Hospital, 1949 Grant Road
- CH-24 Hill Haven Convalescent Hospital, 2530 Solace Court

SAN JOSE

MOUNTAIN VIEW (continued)

CH-25 Julia Sanitarium, 276 Sierra Vista Avenue

SUNNYVALE-CUPERTINO

CH-26 Idylwood Convalescent Hospital, Fremont and Wright

CH-27 Pleasant Hills Convalescent Hospital, 22590 Voss Avenue

LOS GATOS

CH-30 Beverly Manor Convalescent Hospital of Los Gatos, 14966 Terreno de Flores

CH-31 Beverly Manor Convalescent Hospital of Los Gatos, 350 DeSoto Drive

CH-32 Foothills Convalescent Hospital, 407 Dardinelli Lane

CH-33 Grant Convalescent Hospital, 15245 National Avenue

CH-34 Henard Convalescent Hospital, 371 San Jose Avenue

CH-35 Lark Manor Convalescent Hospital, 16605 Lark Avenue

CH-36 Spotswood Convalescent Hospital, 16412 San Jose Avenue

CH-37 Sprague's Grant Convalescent Hospital, 15245 National Avenue

SANTA CLARA

CH-38 Hearthstone Convalescent Hospital, 2790 Newhall

CH-39 Mission Convalescent Hospital, 410 N. Winchester Blvd.

SAN JOSE

CH-40 Bellerose Convalescent Hospital, 160 Bellerose Drive

CH-41 Conlee Convalescent Hospital, 101 Bernal Avenue

CH-42 Convalescent Hospitals-San Tomas Branch

CH-43 Eastside Convalescent Hospital, 11850 North White Road

CH-44 Forest Avenue Convalescent Hospital, 2065 Forest Avenue

CH-45 Halderman Sanitarium, Inc., 340 Northlake Drive

CH-46 Homeward Convalescent Hospital, 75 North 13th

CH-47 Mt. Pleasant Convalescent Hospital, 1355 Clayton Road

CH-48 Plum Tree Convalescent, 16060 Samaritan Drive

SAN JOSE

SAN JOSE (continued)

CH-49 Spragne's Sanitarium, 264 N. Morrison Avenue

CH-50 Eldercare Convalescent Hospital, 120 Corning Avenue, Milpitas

CH-52 Herman Sanitarium, The, 2295 Pleummer Avenue

CH-53 Holderman Sanitarium, Inc., 340 Northlake Drive

CH-54 Homewood Convalescent Hospital, 75 N. 13th



SAN JOSE

NURSING HOMES

CAMPBELL-SARATOGA

- N-1 Shady Acres Nursing Home, 531 N. Central Avenue
- N-2 Sunset Annex Nursing Home, 2541 S. Bascom Avenue
- N-3 Campbell Nursing Home, 1998 S. Bascom Avenue
- N-4 Haven of Rest Nursing Home, 2020 S. Bascom Avenue
- N-5 Roberts Nursing Home, 826 Dry Creek Road

SUNNYVALE-CUPERTINO

- N-6 Madera Highlands Nursery for Mongoloid Infants, 10501 Madera Drive

LOS GATOS

- N-10 El Retiro Rest Home, 14870 S. Bascom Avenue
- N-12 Loma Vista Nursing Home, 16951 Cypress Way
- N-13 Our Lady of Fatima Nursing Home, 10605 Lark Avenue

SAN JOSE

- N-14 Eriksholm Rest Home, 10431 South Fleming Avenue
- N-15 Bernie Nursing Home, 27 Cleaves Avenue
- N-16 Burbank Nursing Home, 309 S. Willard Avenue
- N-17 Cleaves Nursing Home, 49 Cleaves Avenue
- N-18 Empire Nursing Home, 30 E. Empire
- N-19 Hilltop Nursing Home, 3619 Westwood Drive
- N-20 Little Sonles Nursery for Retarded Children, 10164 Empire Av., Mta. Vista.
- N-21 Riverside Nursing Home, 976 Riverside Drive

SAN JOSE

GOVERNMENT HEALTH OFFICES AND FACILITIES

PALO ALTO

- GH-1 Health Dept. (PA, MV, and LA), 270 Grant Palo Alto
- GH-2 Palo Alto Service Center, 3427 Alma
- GH-3 Water Dept. (Menlo Park), 701 Laurel Menlo Park
- GH-4 Naval Air Station Medical Dept., Building # 13 Moffett Field

SANTA CLARA

- GH-6 County Health Department, 2220 Moor Park Avenue
- GH-7 Alcoholic Rehabilitation Clinic, 2320 Moor Park Avenue
- GH-8 Coroner, 751 S. Bascom Avenue

SAN JOSE

- GH-9 Health Department, 151 Mission
- GH-10 Municipal Water System, 151 Mission
- GH-11 Poison Control Center, 751 S. Bascom Avenue
- GH-12 City Water Pollution Control Plant, Los Esteros Road, Alviso
- GH-13 Mental Hygiene Dept. (Bu. Social Work), 1885 The Alameda
- GH-14 Bu. of Food & Drug Inspections, 476 Park Avenue
- GH-15 DHEW FGA, 186 N. 1st Street

LOS ANGELES

- GH-16 Santa Clara County Health Dept., 11 Montebello Way

PHARMACEUTICALS - PRODUCTION AND DISTRIBUTION

MANUFACTURERS

PALO ALTO & MILPITAS

- MI-1 Blair Johnson, Inc., 711 Lambert St.
- MI-2 Continental Lab., Inc., P.O. Box 1503
- MI-3 Midtown Pharmacy, Inc., 2675 Middlefield R.
- MI-4 Siler Medical Corp., 201 Welch Road
- MI-5 Peninsula Optical Co., 417 University Avenue

CAMPBELL-SARATOGA

- MI-6 California Pharmaceutical Lab, 1210 Camden Avenue

MOUNTAIN VIEW

- MI-7 Air Products & Chemicals, Inc., 465 Whisman Drive

SUNNYVALE-CUPERTINO

- MI-8 Barnes-Hinds Pharmaceuticals, 895 Kifer Road
- MI-9 Ethicon, Inc., 698 E. Taylor Street
- MI-10 Sierakowski, Orth. & Surg. Co., 295 E. Washington Avenue
- MI-11 Argos Dannel Products, 13261 Monte Bello Road
- MI-12 Cali, R. & Bros., 20430 Stevens Creek Road

SANTA CLARA

- MI-14 Commercial Solvents Corp., 95001 (Agnew)

SAN JOSE

- MI-15 Chemart Labs of Calif., Inc., 96 San Jose Avenue
- MI-16 Continental Lab., 45 W. Julian Street
- MI-17 Tasseron Grain Co., 1633 S. 1st, Box 683
- MI-18 International Mining & Chem. Corp., 1931 S. 1st
- MI-19 Jones Chemicals, Inc., 985 Landess Avenue, Milpitas

**SAN JOSE**

SAN JOSE (continued)

**MI-20 Miller Orthopedic App., Inc., 235 E Santa Clara**

**MI-21 Alcohol Distributor, 3220 Verdant Way**

SAN JOSE

WHOLESALEERS

PALO ALTO-MENLO PARK

- WH-1 Calif. Av. Pharmacy Inc., 392 California Avenue
- WH-2 Charleston Center Pharm. Inc., 3920 Middlefield Road
- WH-3 Golden Valley Nat'l Sales Dist. Co., Inc. 378 Cambridge Avenue
- WH-4 Medical Specialities Labs., 300 Homer Avenue
- WH-5 Eli Lilly & Co., 770 Welch Road
- WH-6 Smith, Kline, & French Labs., 800 Welch Road

CAMPBELL-SARATOGA

- WH-7 Pace Optical Co., 201 E. Hamilton Avenue

LOS ALTOS

- WH-9 O'Connell, James & Son, San Felipe Road, 10 Mi. E.
- WH-10 Whitecliff Labs. Inc., 401 1st

MOUNTAIN VIEW

- WH-11 Sierakowski Orthp. & Surg. Co., 205 South Drive
- WH-12 Continental Labs., 465 Castro
- WH-13 Wallace Pharmaceutical, 1901 E. Middlefield Road

SUNNYVALE-SUPERTTINO

- WH-14 Linda Mar Pharm. & Drug Co., 877 W. Fremont Avenue
- WH-15 Sunnyvale Clinic Pharmacy, 594 Carrol Street
- WH-16 Armanini Drug Stores, 201 S. Murphy Av.
- WH-17 Squibb, E.R. & Son, 20692 Cheryl Drive

SANTA CLARA

- WH-19 Drug Service, Inc., 376 Reed Street
- WH-20 Delta Drugs, Inc., 2119 Delta Cruz Blvd.
- WH-22 Milview Pharmacy, 44 Milpitas Center Mil.
- WH-23 Sheraton Labs. Inc., 1400 Coleman Avenue

SAN JOSE

SAN JOSE

- WH-24 Aid Wholesale Drug. Co., 206 Commercial
- WH-25 Brunswick Drug Co., 395 Commercial
- WH-26 Janco Welding Supplies, 501 Auzerias Avenue
- WH-27 Hoechst Pharmaceutical, Inc., 1103 Beaumont Drive
- WH-28 McCormack Drug Inc., 1088 Lincoln Avenue
- WH-29 PAC Coast Bleach, 1452 Whitton Avenue
- WH-30 Salsbury Labs, 190 W. Commercial Street
- WH-31 Bischoff (Office and Warehouse), 1011 Timothy Drive

SAN JOSE

HOSPITAL EQUIPMENT AND SUPPLIES

MENLO PARK

- HS-1 Ad Craft Services of Cal. Inc., 3923 Bohannon Drive
- HS-2 American Hospital Supply Corp., P.O. Box 2207, 150 Jefferson Drive
- HS-3 Johnson & Johnson, 4100 Bayshore Highway
- HS-4 Parke Davis & Co., 135 Commonwealth Drive
- HS-5 Upjohn Company, 120 Scott Drive
- HS-6 Winthrop Labs. Div. Ster. Drug Co., 160 Scott Drive

PALO ALTO

- HS-7 Concept, Inc., 2061 Euclid Avenue, E.P.A.
- HS-8 Guilmette, U.M., 701 Welch Road
- HS-9 Muller, V. & Co., 261 Hamilton Avenue
- HS-10 Palo Alto Orthopedic Co., 431 Waverly
- HS-11 Bradox, 876 San Antonio Road
- HS-12 Sanborn-Div. Hewlett-Packard, 1101 Embarcadero Road
- HS-13 Caw Engineering Inc., 2532 Pulgas Avenue

CAMPBELL-SARATOGA

- HS-14 A to Z Rental Center, 12299 S. Hwy. # 9
- HS-15 Cambrian Orthopedic Service, 2891 S. Pascom Avenue
- HS-16 Miller Orthopedic Appl. Inc., 235 E. Santa Clara

MOUNTAIN VIEW

- HS-19 Fields Rental Service, 1707 El Camino Real
- HS-20 Porter Rents, 2485 Middlefield Road

LOS GATOS

- HS-21 El Gato Rental & Supply Inc., 14789 S. Bascom Avenue
- HS-22 Horton's Laboratory Animal Inc., 20151 Thompson Road

SAN JOSE

LOS GATOS (continued)

HS-23 Van Waters and Rogers, 3745 Bayshore Blvd., Brishn

SUNNYVALE-CUPERTINO

HS-24 Scientific Instrument Co., 1128 W. Evelyn Avenue

SANTA CLARA

HS-26 Abbey Rents, 4695 Stevens Creek Road

HS-27 Brannon's United Rent-Alls, 2455 The Alameda

HS-28 Hospital Service & Supply, 376 Reed

SAN JOSE

HS-29 Pond, A.G. Co., 495 W. Julian Street

HS-30 Sparkle Products, Inc., 420 Umbarger Road

HS-31 Beech-Nut Life Savers, Inc., Senter Road & Phelam Avenue

HS-32 O'Connor Center Pharmacy, 498 O'Connor Drive

HS-33 A to Z Rental Center, 4702 Ross Avenue

HS-34 Aarow Rental Service (Williams Rental Inc.), 845 Park Avenue

HS-35 Betone of San Jose, 34 S. 1st

HS-36 Bischoff Civ. Will Ross Inc., 960 S. Bascom Avenue

HS-37 Dohrman Co., 233 Commercial

HS-38 Family Pharmacy (Rentals), 2061 Lincoln Avenue

HS-39 San Jose Surgical Supply Inc., 433 S. Bascom Avenue

HS-40 Bauer-Black (Div. of Kendall Co.), 1404 S. 7th

HS-41 Danz, G. & Sons, 231 E. Santa Clara

HS-42 Maico & Sons S.J. Hear. Aid Ctr., 42A S. 1st

HS-43 Sonotone Hearing Aid Center, 25 N. 14th

HS-44 Transistor Hearing Aid Co., 135 W. Santa Clara

HS-45 Chancellor Industries Inc., 1360 N. Winchester Blvd.

HS-46 Hittenberger's, 145 W. Santa Clara

HS-47 Miller Orthopedic, 25 N. 14th



## ALBUQUERQUE

### HOSPITALS

- H-1 Atchison, Topeka & Santa Fe Memorial Hosp., 806 Central Avenue, SE
- H-2 Bataan Memorial Methodist Hosp., 5400 Gibson Blvd. SE
- H-3 Bernalillo County-Indian Hosp., 2211 Lomas Blvd., NE
- H-5 Presbyterian Hosp. Center (Includes Maytab Research Lab, Presby. Hosp. and Presby. Sanatorium)
- H-6 Public Health Service Indian Hosp., 801 Vassar Drive, NE
- H-7 St. Joseph Hosp., 715 Grand Avenue, NE
- H-8 Sandia Base Army Hospital (Formerly U.S. Army Hosp.)-Sandia Base
- H-9 Southwest Dental Hospital, 126 Quincy, NE
- H-10 Veterans Administration Hosp., 2100 Ridgecrest Drive
- H-11 Doctors Hospital
- H-12 Osteopathic Hospital, 1127 University Blvd., NE.
- H-13 12-0857 Osteopathic Hospital Association, Inc., 1127 University Blvd, N.E.
- H-14 12-0864 Veterans Administration Hospital Bldg. 4&5 Albuquerque
- H-15 12-1026 PHS Indian Hospital, 801 Vassar Drive, NE
- H-16 62515 Nazareth Hospital, 310 Alameda Road, N.E.

ALBUQUERQUE

NURSING HOMES

- N-1 Casa Angelica, 5629 Isleta Blvd., SW
- N-2 Casa de Mia-Home for the Aged, 1800 Betts, NE
- N-3 Casa Maria-Ladies Home for Aged, 400 12th Street, N.W.
- N-4 Chapman's, The Inc., 236 High NE
- N-5 Encino Gardens Care Center (CNS), 904 Lomas Rd., NE
- N-6 Ridgecrest Manor Progressive Care Center, 2441 Ridgecrest Drive, SE
- N-7 Rio Grande Nursing Home, Inc., 1629 Bowe Lane, SW
- N-8 Sandia Ranch, 6903 Edith Blvd., NE
- N-9 Seven Heavens Convalescent and Nursing Home, 2012 Washington NE

ALBUQUERQUE

GOVERNMENT OFFICES

GH-1 Health, 400 Marquette Avenue

GOVERNMENT OFFICES-COUNTY OF BERNALILLO

GH-2 Health Department, 1111 Stanford Drive

GOVERNMENT OFFICES-STATE OF NEW MEXICO

GH-3 Health Department, Cuba Field Mobile

GH-4 Nursing Board, 505 Marquette Avenue

GH-5 Pharmacy Board, 505 Marquette Avenue

GH-6 Public Health Laboratory, 305 Terrace Avenue

GH-7 State Hospital District, University Hill

GOVERNMENT OFFICES AND FACILITIES-FEDERAL

GH-8 Albuquerque Indian School Clinic, 907 Indian School Road

GH-9 Bureau of Narcotics-Dept. of Treas., Federal Office Building

GH-10 Drug Abuse Control FDA, 423 Gold Avenue

GH-12 Indian Sanatorium, 801 Vassar Drive

GH-13 PHS-Cochita Health Project, Cochita-Pueblo

GH-15 PHS-Indian Health Division, 500 Gold Avenue

GH-16 Practical Nurse Training School, 1015 Indian School Road

ALBUQUERQUE

DRUGGISTS-MANUFACTURERS

- MH-1 Carmel & Co., 606 Dartmouth Dr.
- MH-2 Sandia Pharmaceuticals, Inc., 2329 Wisconsin
- MH-3 Esco-Bio-Chemicals Co., 1406 Central Avenue

ALBUQUERQUE

DRUGGISTS-WHOLESALE

- WH-1 Baxter, Don, 2111 Commercial
- WH-2 Davis Bros., Inc., 1701 Broadway
- WH-3 Great Western Serum Co. Dist., 1709 Girard St.
- WH-4 Marika of Albuq, 3001 Monte Vista
- WH-5 New Mex. Pharmacal Co., 3512 Constitution Ave.
- WH-6 Walgreen's Warehouse, 1605 Broadway
- WH-7 Wholesale Drugs Inc., 409 Broadway
- WH-8 Schoenfelder, M. Ron, 8223 New Hampshire
- WH-9 Model Pharmacy, 3523 Lomas Blvd.
- WH-10 Parox-Ease Agency, 1309 Central Avenue
- WH-11 Chavez Orlando, 536 Veranda Road
- WH-12 Fox-Vliet Drug Co., 1501 12th Street
- WH-13 Marshemory Labs., Inc., 510 2nd Stret
- WH-14 Southwest Drug Co., 809 Tijeras Avenue
- WH-15 Fox, William F., 1133 Quincey
- WH-16 Scott, Calvin & Co., Inc., 1520 Central Avenue

ALBUQUERQUE

HEALTH SUPPLIES

HS-2 New Mexico Steel Co., 5th and Marquette

HEARING AIDS

HS-3 Albuq Hearing Aid Center, 908 Lomas Blvd.

HS-4 New Mex. Hear. Aid Center, 111 7th

HS-5 Sonotone of Albuquerque, 204 3rd

HS-6 Stover's Hear. Aid Specialist, 203 2nd

HS-7 Audiotone Hearing Aids, 124 Quincey

HS-8 Sandia Hearing Aid Service, 1307 A San Mateo Blvd.

HS-9 Belltone of New Mexico, 313 Gold Avenue

HOSPITAL EQUIPMENT AND SUPPLY

HS-10 AAA Rent It Center, 3244 San Mateo Blvd.

HS-11 Ersco Rents, 137 San Pedro Drive

HS-12 Highland Rx Pharmacy, 717 Encino Place

HS-13 New Mex. Chemical-Surg. Co., Inc., 1407 University Blvd.

HS-14 Southwest Surgical Supply Co., 3505 Constitution

HS-15, Spencer Spirella Corsetiere, Inc., 314 Valencia

HS-16 Van Waters & Rogers, 324 Industrial Avenue

HS-17 West Side Drug Store, Old Town Shopping Center

HS-18 A to Z Rental Center, 5029 4th

HS-19 Plant Equipment Co., of New Mex., 724 2nd

HS-20 Albuq. Prosthetic Cntr., Inc. 2818 Central Avenue

HS-21 Brown, Joe E. Apothecary, 106 Girard Blvd.

HS-22 Clinical Pharmacy, 5002 Gibson Blvd.

HS-23 Duke City Art. Limb & Brace, 1229 San Mateo Blvd.

HS-24 Welch's Art. Eye Center, 401 Serra Drive

#### ALBUQUERQUE

HS-25 Aloe Medical & Scientific Co., 119 Richmond Drive

HS-26 Mountain States Tel & Tel Co., 625 Silver Svenue

HS-27 Anderson Surgical Supply, 6725 Coors Road

#### LABORATORY EQUIPMENT AND SUPPLIES

HS-28 Conrad Incorporated, 11701 La Cueva Lane

HS-29 New Mex. Chem. & Surg. Co., Inc., 1407 University Blvd.

#### X-RAY APPARATUS AND SUPPLIES

HS-31 Blair X-Ray, 2016 Ridgcrest Drive

HS-32 Hospital & Medical Service (X-Ray), 106½ Cornell Drive

HS-33 Picker X-Ray Rocky Mt. Inc., 113 Sierra Drive

HS-34 General Electric Co. (X-Ray), 515 Silver Avenue

HS-35 Technical Equip. Corp. (X-Ray), 4501 Palo Duro Avenue

HS-36 Westinghouse Elec. Corp. (X-Ray), 5301 Central Avenue

DETROIT

HOSPITALS

DEARBORN

- H-1 Dearborn Medical Center Hosp., 10149 Michigan Avenue
- H-2 Oakwood Hosp., 18181 Oakwood Blvd.
- H-3 Veterans Adm. Hosp., Southfield & Outer Drive

DETROIT

- H-4 Alexander Blain Hosp., 2201 E. Jefferson Avenue
- H-5 Barlow Gen'l Hosp., 292 E. Ferry Street
- H-6 Boulevard Gen'l Hosp., 1852 W. Grand Blvd.
- H-7 Brent Gen'l Hosp., 16260 Dexter Blvd.
- H-8 Burton Mercy Hosp., 271 Eliot Street
- H-9 Children's Hosp. of Mich., 5224 St. Antoine Street
- H-10 Crittenton Hosp., 1554 Tuxedo Avenue
- H-11 Delray Gen'l Hosp., 7125 W. Jefferson Avenue
- H-12 Detroit Gen'l Hosp., 1326 St. Antoine Street
- H-13 Detroit-Macomb Hospitals Assn., 1420 St. Antoine Street, AND  
South Macomb Hosp., 11800 E. 12 Mi. Road
- H-14 Doctors Hosp., 2730 E. Jefferson Avenue
- H-15 East Side Gen'l Hosp., 2199 Cadillac Blvd.
- H-16 Evangelical Deaconess Hosp., 3245 E. Jefferson Avenue
- H-17 Grace Hosp., 4160 John R. Street
- H-18 Harper Hosp., 3825 Brush Street
- H-19 Henry Ford Hosp., 2799 W. Grand Blvd.
- H-20 Herman Kiefer Hosp., 1151 Taylor Avenue
- H-21 Holy Cross Hosp., 4777 E. Outer Drive
- H-22 Hutzel Hosp., 432 E. Hancock Avenue



DETROIT

DETROIT (continued)

- H-23 Jennings Mem'l Hosp., 7815 Jefferson Avenue
- H-24 Kirwood Gen'l Hosp., 301 E. Kerby Avenue
- H-25 Lafayette Clinic, 951 E. Lafayette Street
- H-26 Lakeside Gen'l Hosp., 988 E. Larned Blvd.
- H-27 Lincoln Hosp., 1053 25th Street
- H-28 Lister Gen'l Hosp. 10040 Yellowstone Avenue
- H-29 Mercy Gen'l Hosp., 2929 W. Boston Blvd.
- H-30 Metropolitan Hosp., 1800 Tuxedo Avenue
- H-31 Mount Carmel Mercy Hosp., 6071 W. Outer Drive
- H-32 North Detroit Gen'l Hosp., 3105 Carpenter Street
- H-33 Park Community Hosp., 801 Virginia Park
- H-34 Plymouth Gen'l Hosp., 15361 Plymouth Road
- H-35 Redford Community Hosp., 25210 Grand River Avenue
- H-36 Rehabilitation Institute, 261 Mack Blvd.
- H-37 St. Clair Hosp., 7850 E. Jefferson Avenue
- H-38 St. John Hosp., 22101 Moross Road
- H-39 St. Joseph Mercy Hospital, 2200 E. Grand Blvd.
- H-40 Salvation Army William Booth Mem'l Hosp., 130 W. Grand Blvd.
- H-41 Saratoga Gen'l Hosp., 15000 Gratiot Avenue
- H-42 Sinai Hosp. of Det., 6767 W. Outer Drive
- H-43 Straith Mem'l Hosp., 2605 W. Grand Blvd.
- H-44 Towne Hosp., 531 E. Grand Blvd.
- H-45 Trumbull Gen'l Hosp., 3966 Trumbull Avenue
- H-46 U.S. Public Health Service Hosp., 14700 Riverside Drive
- H-47 Abbey Medical Hosp., 12250 12 Mi. Rd.
- H-48 Art Centre Hosp., 5435 Woodward

## DETROIT

### DETROIT (Continued)

- H-49 Bailey General Hospital, 292 E. Ferry
- H-50 Civic Hospital, 610 E. Grand Blvd.
- H-51 Columbia Medical Hosp. & Nursing Home, 250 E. Columbia
- H-53 Haynes Memorial Hosp., Inc., 73 E. Palmer
- H-54 Highland Park Gen'l Hosp., 369 Glendale
- H-55 Lynn Hospital, 25750 W. Outer Drive
- H-56 Mount Lebanon Hospital Inc., 2619 14th
- H-57 Nat'l Jewish Hospital at Denver, 18101 Jas. Couz.
- H-58 Northwest General Hospital, 8741 W. Chicago
- H-59 Plamer Osteopathic Hospital, 18160 Woodward
- H-61 Parkvue General Hospital, 28303 Joy Road
- H-62 St. Francis Hospital, 3411 Evaline
- H-63 Thomas, Edyth K. Memorial Hospital Inc., 556 Garfield
- H-64 Zieger Osteopathic Hospital, 4244 Livernois

### ELOISE

- H-65 Wayne County General Hospital and Infirmary, 30712 Michigan Avenue

### FARMINGTON

- H-66 Botsford Gen'l Hospital, 28050 Gd. River (PDR)

### GARDEN CITY

- H-67 Parkvue Gen'l Hosp., 28303 Joy Road

### GROSSE POINTE

- H-69 Bon Secours Hosp., 468 Cadieux Road
- H-70 Cottage Hosp., of Grosse Pointe, 159 Kercheval Avenue

### HAMTRAMCK

- H-71 St. Francis Hosp., 3411 Evaline Street

## DETROIT

### HIGHLAND PARK

- H-73 Woodward Gen'l Hosp., 13535 Woodward Avenue
- H-74 Detroit Osteopathic Hospital, 12523 3rd Highland Park
- H-75 North Woodward Hospital, 12024 Woodward Highland Park

### LINCOLN PARK

- H-77 Outer Drive Hosp., 26400 W. Outer Drive

### LIVONIA

- H-78 Ardmore Acres Hosp., 19810 Farmington Road
- H-79 St. Mary Hosp., 36475 5 Mi. Road

### NORTHVILLE

- H-80 Hawthorn Center, 18471 Haggerty Road
- H-81 Northville State Hosp., 41001 W. 7 Mi. Rd.
- H-82 Wayne County Training School, 16000 Sheldon Road
- H-83 William H. Maybury Sanatorium, 49000 7 Mi. Road

### RIVER ROUGE

- H-84 Sidney A. Sumby Mem'l Hosp., 234 Visager Road

### TRENTON

- H-85 Seaway Hosp., 5450 S. Fort Street
- H-86 Riverside Osteopathic Hospital, 150 Truax Trn.

### WAYNE

- H-87 Annapolis Hosp., 33155 Annapolis Road
- H-88 Carpenter Hosp. and Clinic, 3835 Biddle Street
- H-89 Nankin Hosp., 35550 Michigan Avenue
- H-90 Carpenter Hospital, 34800 Norris Wayne

### WYANDOTTE

- H-91 Wyandotte Gen'l Hosp., 2331 Van Alstyne Blvd.

## DETROIT

### OAKLAND COUNTY--FERNDAL

H-92 Ardmore Hospital, 814 W. 9 Mi. Road

### ROYAL OAK

H-106 Oakland Cntr. Hosp., 120 W. 11 Mi. Road

H-107 William Beaumont Hosp., 3601 W. 13 Mi. Road

### SOUTHFIELD

H-108 Providence Hosp., 16001 W. 9 Mi. Road

### WARREN

H-113 Glen Eden Hosp., 6902 Chicago Road

H-114 Memorial Hosp. of Warren, 23700 Van Dyke Street

H-115 McNamara, Patrick V. Memorial Hosp. & Medical Center, 4050 12 Mi. Rd.

### DETROIT

H-116 Redford Community Hospital, 25210 Grand River Avenue (PDH)

H-117 St. Joseph Mercy Hosp., 2200 E. Grand Blvd. (PDH)

H-118 Holy Cross Hospital, 4777 E. Outer Drive (PDH)

H-119 East Side General Hosp., 2199 Casillac (PDH)

H-120 U.S. Public Health Service Hosp., 14700 Riverside Drive (PDH)

H-121 Saint John Hospital, 22101 Moross (PDH)

### GARDEN CITY

H-122 Garden City School Warehouse, 28586 Maplewood Avenue (PDH)

### GROSSE POINTE AND GROSSE POINTE FARMS

H-125 Bon Secours Hospital, 615 S. Bower (PDH)

H-126 Cottage Hospital of Grosse Pointe, 159 Kercheval (PDH)

H-129 Wayne County Training School, 16100 Sheldon Road (PDH)

H-130 Northville State Hospital, A Bldg. Basement 41001 Seven Mile Road (PDH)

### ROYAL OAK

H-133 William Beaumont Hospital, 3601 W. 13 Mi. Road (PDH)

DETROIT

ROYAL OAK (continued)

H-134 William Beaumont Hospital, 3601 W. 13 Mi. Rd. (PDH)

H-135 William Beaumont Hospital, 3601 W. 13 Mi. Rd. (PDH)

SOUTHFIELD

H-136 Congregation Shaary Zedeck Synagogue, 27375 Bell Rd. (PDH)

MACOMB COUNTY--ST. CLAIR

H-137 River District Hospital, 4100 S. River Rd. (PDH)

H-138 Memorial Hospital of Warren, 23700 Van Dyke, Warren (PDH)

H-139 Bi-County Community Hospital, 13355 E. Ten Mile Road (PDH)

DETROIT

NURSING HOMES

WAYNE COUNTY--ALLEN PARK

N-1 Allen Park Convalescent Home, 9150 Allen Al. Pk.

DEARBORN HEIGHTS

N-2 Dearborn Heights Convalescent Center, 26001 Ford Dea. Hgts.

DETROIT

N-3 Acacia Convalescent Home, 600 E. Gd. Blvd.

N-4 Addison-King Nursing Home, Inc., 716 E. Gd. Blvd.

N-5 Alden Convalescent Home, 3119 E. Jefferson

N-6 Allan Dee Skilled Nursing Center, 12900 W. Chicago

N-7 Alpha Annex Nursing Home, 609 E. Grand Blvd.

N-8 Alpha Manor Nursing Home, 440 E. Grand Blvd.

N-9 Americana Convalescent Center, 16588 Schaeffer

N-10 Americane Convalescent Center, 19211 Anglin

N-12 Arlington Hardwicke Nursing Home, 240 Mack

N-13 Avonside Nursing Home, 590 E. Gd. Blvd., 791 E. Gd. Blvd.

N-14 Bancroft Nursing Home, 4262 W. Fort

N-15 Barton Nursing Home, Inc., 722 E. Gd. Blvd.

N-16 Bel-Air Convalescent Home Inc., 12007 Linwood

N-17 Belle Field Convalescent Home, Inc., 688 Field

N-18 Belmont Nursing Center, Inc., 19840 Harper

N-19 Boulevard Convalescent Homes, Inc., 570 E. Gd. Blvd.

N-20 Brightview Convalescent Home & Clinic, 24340 W. McNichols

N-21 Brooks Convalescent Center, 491 E. Gd. Blvd.

N-22 Brown's Convalescent Home, 341 Westminster

N-23 Burns Home Sanitarium, Inc., 1926 W. Grand Blvd.

DETROIT

DETROIT (continued)

- N-24 Cadillac Nursing Home, 1533 Cadillac Blvd.
- N-25 Cambridge Nursing Center, 18633 Beech Daly Rd.
- N-26 Chandler Convalescent Center, 511 E. Gd. Blvd.
- N-27 Colonial Nursing Home, 14000 Woodrow Wilson
- N-28 Community Nursing Home, 657 E. Gd. Blvd.
- N-29 Coplin Manor Convalescent Home, 4721 Coplin
- N-30 Cranbrook Nursing Home, 5000 E. 7 Mi.
- N-31 David Nursing Home, 13241 W. Chicago
- N-33 East Civic Convalescent Home, 670 E. Gd. Blvd.
- N-34 East Grand Nursing Home, 130 E. Grand Blvd.
- N-35 Edgewater Convalescent Center, 22811 W. 7 Mi.
- N-36 Fair Acres Nursing Homes, Inc., 22600 Armada Ridge Road
- N-37 Fairlane Memorial Convalescent Home, 15750 Joy
- N-38 Franklin Convalescent Home, 391 E. Gd. Blvd.
- N-39 Georgian Court Nursing Home, Inc., 626 E. Gd. Blvd.
- N-40 Hamilton Nursing Home, Inc., 590 E. Gd. Blvd.
- N-41 Hillcrest Convalescent Center, Inc., 12535 Harper
- N-42 Holbrook Convalescent Center, 936 Holbrook
- N-43 Ingleside Convalescent Center, Inc., 9155 Woodward
- N-44 Jefferson Convalescent Home, 3735 E. Jefferson
- N-45 Jessie Thompson Convalescent Home, 650 E. Gd. Blvd.
- N-46 Katharina Convalescent Home, 651 E. Gd. Blvd.
- N-47 Krethzschmar Nursing Home, Inc., 535 E. Gd. Blvd.
- N-48 La Belle Convalescent Home, 1599 LaBelle
- N-49 Lafayette Convalescent Home, Inc., 2707 W. Lafayette
- N-50 Lakeland Convalescent Center, 751 E. Gd. Blvd.

DETROIT

DETROIT (continued)

- N-51 Lakewood Nursing Center, Inc., 8181 E. Jeff
- N-52 La Salle Nursing Home, 2411 W. Grand Blvd.
- N-53 Law-Den Convalescent Home, 1640 Webb
- N-54 Lin-Elm Nursing Center, Inc., 12007 Linwood
- N-55 Longfellow Nursing Center, 9520 Woodward
- N-56 Mary L. Nursing Home, 8311 E. Jeff.
- N-57 Maywood Convalescent Home, 232 E. Palmer
- N-58 Michigan Memorial Institute, 14742 E. Jeff
- N-59 Moncrieff Nursing Home, Inc., 1564 Cadillac Blvd.
- N-60 Moroun Nursing Home, 8045 E. Jefferson
- N-61 Olivia Nursing Home, 3500 John R.
- N-62 Pearl Convalescent Home, 82 King
- N-64 Providence Nursing Home, Inc., 6500 Wabash
- N-65 Riverview Convalescent Home, 8497 S. Riverside Dr.
- N-66 St. Anne's Convalescent Home, Inc., 6232 Cadillac
- N-67 St. Martin De Porres Nursing & Convalescent Center, 1880 E. Ed. Blvd.
- N-68 Southview Convalescent Home, 266 Erskin
- N-69 Strong's Convalescent Home, 206 Eliot
- N-70 Thessalonica Convalescent Home, 1574 Cadillac Blvd.
- N-71 Thompson Jessie Convalescent Home, 600 E. Ed. Blvd.
- N-72 Virginia Park Convalescent Home, 816 Virginia Park
- N-73 Waddell Convalescent Home, 5745 Beaub.
- N-74 Weldon Memorial Convalescent Home, 49 Virginia Park
- N-75 Whitman's Convalescent Home, Inc., 1876 E. Ed. Blvd.
- N-76 Whittier Nursing Home, Inc., 281 W. Ed. Blvd.



## DETROIT

### FARMINGTON

- N-77 Hutcheson Convalescent Home, 21620 Middlebelt Rd.
- N-78 Kendleview Convalescent Home, 32330 12 Mi. Rd.
- N-80 Whitehall Convalescent Home, Inc., 40875 Grand River

### GROSSE POINTE

- N-81 Grosse Pointe Nursing Home, Inc., 315 Fisher Rd.

### RIVER VIEW

- N-82 Marion Manor Nursing Home, Inc., 18591 Quarry Rd.

### HIGHLAND PARK

- N-83 Ford Convalescent Center, 111 Ford
- N-84 Royal Nursing Home & Convalescent Center, 91 Glendale

### INKSTER

- N-85 Scales Convalescent Home, 2936 S. John Daly

### LIVONIA

- N-86 Ardmore Convalescent Home, Inc., 19810 Farmington Rd.
- N-87 Dorvin Convalescent & Nursing Center, Inc., 29270 Morlock
- N-38 Livonia Nursing Center Inc., 28910 Plymouth Rd.
- N-89 Riverbank Convalescent Home, Inc., 34350 Ann Arbor Trl.
- N-90 University Convalescent & Nursing Home, 28550 S Mi. Rd.

### NORTHVILLE

- N-91 Eastlawn Convalescent Inc., 409 High Northville
- N-92 Northville Convalescent Center, Inc., 520 W. Main

### PLYMOUTH

- N-96 West Trail Nursing Home, 395 Ann Arbor Trl.

### TRENTON

- N-97 Balmoral Skilled Nursing Home, 5500 Fort
- N-98 Trenton Convalescent Center, 406 Elm Trn.

**DETROIT**

**WAYNE**

N-99 Clark's Convalescent Home, 34330 Van Born Road

N-100 Dion Nursing Home, 43825 Michigan Wayne

**CLARKSTON**

N-104 Pine Knob Nursing Home, 5580 Waldon Road

**FERNDALE**

N-105 Hilton Convalescent Home, 3161 Hilton Rd.

**NOVI**

N-107 Novi Convalescent Home, 26245 Novi Road

N-108 Whitehall Convalescent Homes, Inc., 43455 W. 10 Mi. Rd.

**ROYAL OAK**

N-124 Holmes' Convalescent Home, Inc., 1725 Chester

N-125 Crowley Convalescent Home, 2440 E. Lin.

N-126 Kirby Convalescent Home, 751 Hendrie Royal Oak

**SOUTHFIELD**

N-129 Southfield Nursing Home, 26051 Lahser Road

**WARREN**

N-136 Abbey Convalescent & Nursing Home, 12250 12 Mi. Road

N-137 Nightingale Nursing Home, 11525 10 Mi. Rd.

DETROIT

GOVERNMENT HEALTH & MEDICAL FACILITIES

WAYNE COUNTY--ALLEN PARK

GH-1 Water Dept., 6515 Roosevelt

DEARBORN

GH-2 Dental Ofc., 4501 Shaeffer

GH-3 Health Dept. Ofc., 13711 Mich.

GH-4 Sanitation Dept., 2701 Greenfield

DETROIT, CITY OF

GH-5 Civil Defense, Ofc. of, 900 Meril Plaisance Palmer Park

GH-6 Det-Wayne County Comm.: Mental Health Serv. Bd., 2 Woodward

GH-7 Fire Dept., Medical Div., 250 W. Larnd.

GH-8 Garbage Street & Alley Cleaning, 1500 Erskin

GH-10 City Physicians (Main Ofc.), 1326 St. Antoine

GH-11 Communicable Disease, 1511 Taylor

GH-12 Franklin Settlement Pediatric Clinic, 3360 Charlvx

GH-13 Industrial Hygiene, 1151 Taylor

GH-14 Poison Inf. Cntr. HermKiefer Hosp., 1151 Taylor

GH-15 Douglas Bruce H., 6900 McGraw

GH-16 Gratiot, 3506 Gratiot

GH-17 Northeast, 5511 Buffalo Ct.

GH-18 Northwest, 14585 Greenfield

GH-19 Quarantine Ofc., 1151 Taylor

GH-21 Water Dept. (Gen'l Ofc.), 735 Randolph

HAMTRAMCK, CITY OF

GH-22 Health Dept., 3201 Roosevelt Ham.

DETROIT

HARPER WOODS

GH-23 Water Dept., 19617 Harper

HIGHLAND PARK, CITY OF

GH-24 Health Dept., 351 Glendale

LINCOLN PARK, CITY OF

GH-25 Civil Defense, 1355 Cleophs Lin. Pk.

GH-26 Sewer Dept., 500 Southfield Road

GH-27 Water Dept., 1355 Southfld. Road

MELVINDALE, CITY OF

GH-28 Sewage Disposal Plant, 3250 Greenfield Mvdl.

GH-29 Water Dept., 3100 Oakwood Mvdl.

REDFORD, TOWNSHIP OF

GH-30 Water & Sewer Dept., 12200 Beech Daly Rdfd.

RIVER ROUGE, CITY OF

GH-31 Health Dept., 1230 Coolidge

GH-32 Sewage Pumping Station, 10120 W. Jefferson

TAYLOR TOWNSHIP

GH-33 Rubbish Dept., 23555 Goddard Rd.

WAYNE COUNTY

GH-34 Health Dept., Main Ofc., Eloise

DETROIT

GH-35 Industrial Health, Eloise

GH-36 Crippled Children Services, 3076 E. Grand Blvd.

GH-37 Health Referral Service, 1040 W. Fort

GH-38 Adult Psychiatric Clinic, 1300 Cad. Sq. Bldg.

GH-39 Area Supervisor--State Day Care, 208 Blvd. Center Bldg.

GH-40 Nursing Home Placement, 640 Temple

DETROIT

DETROIT (continued)

GH-41 Adm. Ofc.--Medical Div. Supervisor, 640 Temple

GH-42 Food & Drug Adm., 1560 E. Jefferson

GH-43 Bur. of Drug Abuse Control, 1036 Lafayette Bldg.

GH-45 Pub. Health Serv. Recruitment Cntr., 14700 Riverside

GH-46 Naval Recruiting Station: Medical Dept., 425 Lafayette Bldg.

GH-47 Narcotics, Bur. of, 602 Federal Bldg.

GH-48 Regional Ofc., Gratiot at Library

DETROIT

DRUGS AND SUPPLIES--MANUFACTURERS

WAYNE COUNTY--DEARBORN AND DEARBORN HEIGHTS

- MH-1 Bell, May Company, 21930 Hickorywood Drive
- MH-2 Brown, W.R. Company, 18217 Snow Dea.
- MH-3 Lane, F.L. Company, 601 Elmwood Dea.
- MH-4 North American Pharmacal, Inc., 6851 Chase Rd.
- MH-5 Stomatone Lab, 25424 W. Warren Dea. Hgts.
- MH-6 Wayne Laboratories, 2020 N. Telegraph Dea. Hgts.

DETROIT

- MH-8 Atlas Pharmaceutical Labs, 13211 Conant Avenue
- MH-9 Berke Chemical Co., 2627 Frederick St.
- MH-10 Cambridge Chemical Prod., Inc., 9182 Greenfield Rd.
- MH-11 Carpenter Chemical Co., 2706 Grand Riv. Av. Det.
- MH-12 Chemical Products Div. of Ex-Cell-O, 8081 Lynch Rd.
- MH-13 Cole Products, 7456 Pembroke Det.
- MH-14 Cooper's Miracle Medicine Co., 9231 Forest
- MH-15 Cord Laboratories, Inc., 19191 Filer Avenue
- MH-16 Cosmetic Labs, Inc., 2272 E. Jeff. Avenue
- MH-17 Crosby, R.H. Formula 909 Prod., 313 Chandler Street
- MH-18 Curtis, A.W. Labs, 454 Farnsworth
- MH-19 Detroit Vet. Supply Co., 1798 Wabash Avenue
- MH-20 Difco Labs, Inc., 920 Henry
- MH-21 Fellows Med. Mfg. Co. Testagar Div., 1354 W. Lafayette Det.
- MH-22 Ferrill & Shank First Aid Co., 1657 Ferry Park
- MH-23 Goodwin Flavors Co., 885 Oakman Blvd.
- MH-24 Handleman Co., 670 E. Woodbridge

DETROIT

DETROIT (continued)

MH-25 In-Flam-Co Products Co., Inc., 15865 Plainview Avenue  
MH-26 Ingram, G.A. Co., The, 4444 Woodward Det.  
MH-28 Lakehurst Pharmacal Co., 11840 Grand River Avenue  
MH-29 Larrowe Feed Co., Box 5171 Seven Oaks Station  
MH-31 Mallard, Inc., 3021 Wabash Avenue  
MH-32 McCabe, R.L. Co., 14849 W. McNichols Rd.  
MH-33 Michigan Capsule Co., 3548 Mitchell Avenue  
MH-34 Monarch Drug Co., 5550 W. Warren Avenue  
MH-35 N&R Chemical Co., 2617 Grand Riv.  
MH-36 Oak Royal Labs, Inc., 9965 Northlawn Avenue  
MH-38 Old Chief Medicine Co., 12428 Connor Det.  
MH-39 Patterson Labs, Inc., 11930 Pleasant Avenue  
MH-40 Paul's Cut Rate Drugs, 1419 Broadway Det.  
MH-41 Physicians Medical Supply, 4651 Berkshire Det.  
MH-42 Red Foot Products Co., Inc., 20131 Joy Rd.  
MH-43 Redyns Company, 2114 Coplin Avenue  
MH-44 Rheumanon Co., Inc., P.O. Box 8622, 4367 Neff Rd.  
MH-45 Ries Hamly, Inc., 17351 Stricker E. Det.  
MH-46 Scherer, R.P. Corp., 9425 Grinnel Avenue  
MH-48 Spartan Rex Drug Co., Inc., 120 Shelden Avenue, Det.  
MH-49 Tedna Chemical Prod., Co., 15328 Deerfield E. Det.  
MH-50 White Cross Pharmacals, Inc., 3134 E. Davison Det.  
MH-51 Wilson & Wolfer, 14833 E. Jefferson Det.  
MH-52 Loren Labs, 2118 Coplin Det.  
MH-53 McGregor & Co., 18063 Jas. Couzens Det.  
MH-54 Mordue, Howard W. (Vanol.Ch.Co.), 3049 E. Grand Blvd.

## DETROIT

### DETROIT (continued)

MH-55 Parke Davis & Co., Jos. Campau Avenue

MH-56 Parke Davis & Co., 3300 E. Jefferson

MH-57 Penathol Labs, 120 Selden

MH-58 Phar-Med Co., 14614 9 Mi. Rd.

MH-59 Smith Chemical Co., 5510 Nottingham Det.

MH-60 Pointe Distributors, 14833 E. Jefferson

### GARDEN CITY

MH-61 Analytical & Biological Labs., 30754 Ford Rd.

### HAMTRAMCK

MH-62 Motor City Rx Center of Det., 9720 Jos. Campau Hamtramck

### HIGHLAND PARK

MH-63 Motor City Prescription Center, 13949 Woodward Avenue

MH-64 Vanol Chemical Co., 13700 Woodward Avenue

### PLYMOUTH

MH-65 Plymouth Laboratories, Inc., 700 Junction St.

### WYANDOTTE

MH-66 Calahan Drug Stores, Inc., 1266 Eureka Avenue

MH-67 Calahan Drug Stores, Inc., 1808 Biddle Avenue

MH-68 Calahan Drug Stores, Inc., 2930 Biddle Avenue

MH-69 New England Pharmacal Co., 700 Chestnut Street

MH-70 Pennsalt Chemicals Corp., 4655 Biddle

MH-71 Wyandotte Chemicals, Corp., 1609 Biddle

### OAKLAND COUNTY--BIRMINGHAM

MH-72 Wabeek Pharm. & Pres. Cntr., Inc., 624 N. Woodward

MH-73 Wabeek Pharm. & Pres. Cntr., Inc., 296 W. Maple



DETROIT

FARMINGTON

MH-74 Lakehurst Pharmacal Co., 24485 Middlebelt Road

FERNDALE

MH-75 780 W. 8 Mi. Road

MH-76 Motor City Rx. Cntr. of Ferndale, 201 W. 9 Mi. Road

MH-77 Pharmaceutical Products Labtries, 23446 Woodward Avenue

MH-78 Pryce Pharmacy, 22830 Woodward Avenue

HAZEL PARK

MH-79 C&M Pharmacal Co., Inc., 1519 E. 8 Mi. Rd.

NOVI

NH-81 Kerr, Frank W. Chemical Co., 43043 W. 9 Mi. Rd.

OAK PARK

MH-82 Arnold Pharmacies, Inc., 15186 W. 8 Mi. Rd.

MH-83 Baggleman, Reuben, 15342 W. 10 Mi.

MH-84 Freshman Vitamin Co., 12751 Capital Avenue

ROYAL OAK

MH-86 Instasan Pharmakon Labtries, 514 E. 4th St. Royal Oak

MACOMB COUNTY--ST. CLAIR SHORES

MH-88 Leiner, P. & Sons, America, Inc., 20101 9 Mi. Rd.

MH-89 Meyer Laboratories, Inc., 22601 Mack Avenue

MACOMB COUNTY--WARREN

MH-92 Llorich Laboratories, Inc., 4061 E. 8 Mi. Rd.

MH-93 Morris, E. Manufacturing Co., 23247 Pinewood War.

MH-94 Motor City Rx Center, 7512 E. 9 Mi. Road

DETROIT

DRUGS AND SUPPLIES - WHOLESALE

WAYNE COUNTY--DEARBORN AND DEARBORN HEIGHTS

WH-1 Bar-Dan Distributors, 6905 Chase Road

DETROIT

WH-2 Airco Industrial Gases Div., Military & John Kross Avenue

WH-3 Alpha Tablets Co., 15497 Beech Daly Rd.

WH-5 Blaess Elevator Co., Box 5171 / Oak - Detroit

WH-6 Camall Company, 11401 E. Seven Rd.

WH-7 Bennett Bros. Wh. Dist., 8490 Lynden

WH-8 Central Comm. Action Ctr. Med. Clinic, 6550 14th @ Ferry Pk.

WH-9 Cooper Drug Co., 3138 Fenkell Avenue

WH-10 Cunningham Drug Store, 1927 12th Street

WH-11 Detroit First Aid Co., 6335 Grand River Avenue

WH-12 Detroit Medical Arts, Inc., 13700 Woodward Avenue

WH-13 Det. Oxygen & Acetylene Co., 2817 E. Grand Blvd.

WH-14 Det. Wholesale Drug Co., 1221 12th Street

WH-15 Diacin Chemical Co., Inc., 12806 Plymouth Road

WH-16 Dibble, Edwin J., 8550 Rutland Bldg., 310

WH-17 Excelento Medicine Co., Inc., 456 Charlotte

WH-18 F.L. Corporation, 3461 W. Outer Drive

WH-19 Kerr, Frank W. Chemical Co., 1734 W. Lafayette

WH-20 Michigan Pharmacal Corp., 18985 Wyoming

WH-21 Michigan Pharmacal, Inc., 11712 Woodward

WH-22 National Brands, Inc., 21000 Hurlburt Avenue

WH-23 National Wholesale Drug Co., 445 E. Lafayette Street

WH-24 O'Connon Drug Co., 15497 Beech Daly Rd.

## DETROIT

### DETROIT (continued)

- WH-25 Perry Laboratories, Inc., 14713 Gratiot
- WH-26 Pi-Lon Labs, Inc., 9016 Van Dyke Det.
- WH-27 Pointe Distributors, 14833 E. Jefferson Avenue
- WH-27 Professional Drug Wholesale, 20528 Lahser Road
- WH-27 Prybyla, Michael (Pry Drug), 19144 Van Dyke Det.
- WH-30 Puritan Compressed Gas Corp., 950 Oakman Blvd.
- WH-31 Roman Cleanser Co., 2700 E. McNichols Rd.
- WH-32 Romar Drug Company, 14311 W. 8 Mi. Rd.
- WH-33 Rudition Tonic Company, 1480 Ferry Park Avenue
- WH-34 Sav-Mor Drug Stores, Inc., 17720 Grand River
- WH-35 Sawall Health Food, 14521 Grand River Avenue
- WH-36 Tracy's Professional Service, 2211 Woodward Avenue
- WH-37 Tutag, S.J. & Co.
- WH-38 World Medical Relief, Inc., 11745 12th Street

### GROSSE POINTE

- WH-39 Huntington, James E. Pharmaceuticals, 564 St. Clair

### HAMTRAMCK

- WH-40 Medicine Shop, 10009 Jos. Campau Ham.

### HIGHLAND PARK

- WH-41 McKesson & Robbins, Inc., 14100 Oakland Avenue
- WH-42 Rupp & Bowman Co., The, 16840 Hamilton Hgh. Pk.

### PLYMOUTH

- WH-44 Spartan Stores, Inc., 9075 Haggarty Rd.

### HAZEL PARK

- WH-46 Sparks, Otto E., 166 W. Davison

DETROIT

LIVERNOIS

WH-47 McCarthy, R.J. Co., 11521 Livernois

OAK PARK

WH-48 Serling Drug Company, 10650 Galaxie Oak Park

SOUTHFIELD

WH-50 Dexter Sales Co., 19322 Birch Ridge

DETROIT

HEALTH SUPPLIES AND EQUIPMENT

WAYNE COUNTY--ALLEN PARK

HS-1 Allen Park Rental, 5022 Allen

HS-2 American Hospital Supply Corp., 17150 Southfield Road

DEARBORN AND DEARBORN HEIGHTS

HS-3 Dearborn Pharmacy, 22691 Michigan Avenue

HS-4 Dearborn Hospital Equip., 24522 Michigan

HS-5 Rent It Corp., 24417 Ford

HS-6 State Battery Co., 22187 Michigan

HS-7 Trudell Pharmacy, 5717 Schaeffer

HS-8 Williams, Geo. B. Co., 2038 Monroe

HS-9 Wrona, Raymond, 3922 Vassar

DETROIT

HS-10 Acton Rentals, 11501 Van Dyke

HS-11 Air-Way Distributors of Det., 15136 Fenkell

HS-12 Allied Chemical Testing Co., 8740 Chicago Det.

HS-13 Aloe, A.S. Co., 18413 Cherylwn

HS-14 Alpine Mfg. Corp., 7605 Lyndon

HS-15 Apollo Hydropeol Co., 23695 W. 7 Mi.

HS-16 Apple-Crone Drugs Labs., 19148 Woodward Avenue

HS-17 Battle Creek Equip. Co., 16244 Jas. Couzens

HS-18 Bluco, Inc., 20273 Beaverland

HS-19 Burdett Oxygen Co., 13500 Sanders

HS-20 Canton China & Equip. Co.

HS-21 Clayman Co., 2927 W. McNichols

HS-22 Colson Corp., The, 11000 W. McNichols

## DETROIT

### DETROIT (continued)

- HS-23 Cottrell-Clarke, Inc., 130 W. Fisher Freeway
- HS-24 Central Labs, 312 Dav. Whitney Bldg. Det.
- HS-25 Cummings, Earl W., 14833 E. Jefferson Det.
- HS-26 Cullen, B.H. Co., 13950 Mansfield Avenue
- HS-27 Dann Co., The 18450 Livernois
- HS-28 Detroit Oxygen Tent Rental Co., 1401 E. Milwke.
- HS-29 Detroit Oxygen Tent Rental Co., 17575 James Couzens
- HS-30 Dowd Rental Service & Sales, Inc., 3740 Cass
- HS-31 Drake Laboratories, 9965 Northlawn
- HS-32 3049 E. Grand Blvd.
- HS-33 2706 Grand River
- HS-34 4367 Neff Road
- HS-35 17609 Patton
- HS-36 3721 Fredk.
- HS-37 16619 Wyoming
- HS-38 1655 Ferry Park
- HS-39 16717 Kentfield Avenue, Det.
- HS-40 General Drug & Sund. Dist. Inc., 17720 Grand River Avenue
- HS-41 Getz, Arthur H., 1401 Milwke.
- HS-42 Getz, Arthur H., 17575 James Couzens
- HS-43 Health Champions, Inc., 13344 Gratiot Det., 48205
- HS-44 Ingram, G.A. Co., The, 4444 Woodward
- HS-45 International Botanical Co., 5728 Michigan Avenue
- HS-46 Ipec Hosp. Supply Corp., 8941 Schaffer
- HS-47 Jacuzzi Whirlpool Bath, 18643 Joy
- HS-48 Jobat Service Center, 426 Fisher

DETROIT

DETROIT (continued)

HS-49 Kamhout, Carl R. Corp., 10037 Chalmers.  
HS-50 Kern Chair & Table Rental Serv., 18726 Hayes  
HS-51 Key Products Co., 1326 E. Woodbridge St.  
HS-52 Kuhlman, A. & Co., 3939 Woodward  
HS-53 Kuttbauer Enterprises, Inc., 6400 Mt. Eliot  
HS-54 Kuttbauer Manufacturing Co., Inc., 2189 Beaufait  
HS-55 Lilly, Eli & Co., 1618 Ford Bldg.  
HS-56 Lilly, Eli & Co., 11000 W. McNichols  
HS-57 Liquid Carbonic Corp., 12820 Evergreen Rd.  
HS-58 Loveland Pharmacy, 4030 W. Jefferson Ecorse  
HS-59 Luzon Sons, 424 Book Bldg.  
HS-60 Maicki, Richard J. 17346 Lasher Rd.  
HS-61 Maid-Rite Garment Mfg. Co., 1025 Brush  
HS-62 Market Forge Co., 16861 Colingham Drive  
HS-63 Miami Pharmacy, 2901 S. Fort St.  
HS-64 Midwest Promotions, 2271 W. Davison  
HS-65 Mordue, Howard W., 3049 E. Grand Blvd.  
HS-66 Motor City Rx Center of Det., 14165 E. 7 Mi.  
HS-67 Motor City Rx Center of Det., 20510 Plymouth  
HS-68 N & R Chemical Co., 2556 Grand River  
HS-69 Newton, W.H., 10013 Appleton Rdfd.  
HS-70 Niedelson, Wm. R. Co., 8514 W. McNichols  
HS-71 North Clinic, 20041 W. 8 Mi. Rd.  
HS-72 Pharmacal Products Co., 14614 E. 9 Mi. Rd.  
HS-74 Pharmaceutical Services, Inc., 9016 Van Dyke  
HS-75 Physicians & Hosp. Equip. Service Co., 3101 Brush

DETROIT

DETROIT (continued)

- HS-76 Plastics Corporation, 14590 Schaeffer
- HS-77 Power Vitamin Sales, 8052 Barnes
- HS-78 Pylo Company, The, 1164 W. Euclid Det.
- HS-79 Professional Equip. Co., 9728 Burnet
- HS-80 Remer, Paul Surgical Appliances, 13616 Gratiot
- HS-81 Rent It, 22020 Gratiot
- HS-82 Research Engineering Dept., 18066 James Couzens Hwy.
- HS-83 Reynold's Supply Co., 21612 W. McNichols
- HS-84 Richards' Mfg. Co., 18055 Jas. Couzens
- HS-85 Rowley, Ett. Co. of Det. Inc., 11330 Woodward
- HS-86 Sargent, E.H. Co., 8560 W. Chicago Avenue
- HS-87 Sealy Mattress Co., 5914 Federal
- HS-88 Seltzer's Pharmacy Inc., 160 Bagley Avenue
- HS-89 Science Generic Drug Co., 2556 Grand River
- HS-90 Sewall Enterprises, 909 Calvert Street
- HS-91 Smith, Ira H. Prescriptionist, 16147 W. McNichols Road
- HS-92 Sparling, C.D. Co., 1736 Howard
- HS-93 Stainless Equip. Mfg. Co., 310 Piquet
- HS-94 Standard Drug Supply, 18708 John R.
- HS-96 Supreme Distribution Co., 2714 Riopel
- HS-98 Washington Equip. Sales Co., 4620 Cass
- HS-99 Wilfred J. Dowd & Co., 3519 Michigan
- HS 100 Williams Drug Center Inc., 454 E. Forest Det.
- HS-101 Williams Drug Center Inc., 8401 Woodward Avenue
- HS-102 Will Ross Inc., 5433 Belvue
- HS-103 McGill Wm. V. & Co., 9141 E. Jefferson



DETROIT

DETROIT (continued)

HS-104 Mundy, Harold W., 21238 W. 7 Mile

HS-105 Towson, Herbert D., 1559 Guardian Bldg.

GARDEN CITY

HS-106 Tri-Medico Inc., 5711 Inkster Gar. Cy.

HIGHLAND PARK

HS-107 Beta Cibus Co., 166 W. Davison Hgh. Pk.

HS-109 Drug Industries Company, 13700 Woodward Avenue

HS-110 Therapeutic Products Inc., 16400 Woodward

LINCOLN PARK

HS-111 MacBrick Co., The, 2075 Fort Lin. Pk.

HS-112 Norton Prescription Pharmacy Inc., 1660 Fort Lin. Pk.

LIVONIA

HS-113 Wayne Surgical Supply Co., 33740 Plymouth Road

HS-114 Detroit Pharmacal Co., 18604 Foch Street

HS-115 Great Lakes Wholesale Drugs Inc., 11751 Levan Road

WAYNE

HS-116 Able Table Chair Rental Service, 32032 Michigan Wayne

WYANDOTTE

HS-117 Grove Drugs, Inc., 3897 Fort Hwy. Wyan.

OAKLAND COUNTY--BIRMINGHAM

HS-118 Leo, A.I., 1025 E. Maple

HS-119 Wilmot Castle Co., 1025 E. Maple Rd.

FARMINGTON

HS-121 American Sterilizer Company, 32580 Grand River

HS-122 McGregor & Company, 32580 Grand River

DETROIT

FERNDALE

HS-123 Gage Products Company, 625 Wanda Avenue, Ferndale

HS-124 Medical Supply Corp., 1421 E. 8 Mi. Rd.

HS-125 National Cylinder Gas, 1301 Jarvis Street

HS-126 Randolph Surgical Supply Co., 10770 Galaxie Avenue

HAZEL PARK

HS-127 Sivad Bio Research Company, 22920 John R.

OAK PARK

HS-128 Coffman Pharmacal Co., 24341 Jerome

ROYAL OAK

HS-133 Button's Rent It Shop, 1126 W. Washington

HS-134 C&M Rental Inc., 4130 Rochester Rd.

HS-135 Modern Medical Supply Co., 208 W. 11 Mi. Rd.

HS-136 Nutri Foods, 120 S. Main Street

WARREN

HS-137 Rent It, 28640 Van Dyke

HS-138 U.S. First Aid, 7012 Packard

HS-139 Union Carbide Corp., 21725 Groesbeck Hwy.

DEARBORN

HS-140 Keffer, Frank Orthopedic Co., 13046 Michigan

DETROIT

HS-141 Brenner Orthopedic Co., 17346 W. McNichols

HS-143 D'Arcy Surgical Stores, 3750 Woodward Avenue

HS-144 D'Arcy Surgical Stores, 13214 W. McNichols

HS-145 Hartz, J.F. Co., 1529 Broadway

HS-146 Kay Rehabilitation Prod., Inc., 15841

HS-147 Michigan Artificial Limb Co., 8933 Harper

DETROIT

DETROIT (continued)

HS-148 Veteran's Artificial Limb Co., 8933 Harper

HS-149 Wright & Filippis, 11526 Woodward

HIGHLAND PARK

HS-150 Medical Arts Surgical Garment Co., 13714 Woodward

HS-151 Park Orthopedic Service, 30958 Ford Road, Garden City

OAKLAND COUNTY--BIRMINGHAM

HS-152 Becker Orthopedic Appliance Co., 1776 S. Woodward

DETROIT

HS-156 American Hospital Equip. Co., 8020 W. McNichols

HS-157 Bird Respirator Corp., 2161 W. McNichols

HS-158 Detroit Oxygen & Acetylene Co., 2817 E. Grand Blvd.

HS-159 Detroit Oxygen Tent Rental Co., 1401 E. Milwke.

HS-160 Detroit Oxygen Tent Rental Co., 17575 Jas. Couzens

HS-161 Dietrich Oxygen Tent Rental Service, 16941 Hamilton

HS-162 Oxy-Aid of Mich., 10635 W. 8 Mile

FERNDALE

HS-163 Homedic Inc., 10770 Galaxie Avenue

HS-164 Nat'l Cylinder Gas-Div. of Chemetron Corp., 1301 Jarvis

ROYAL OAK

HS-167 C&M Rental Inc., 4130 Rochester Road

SOUTHFIELD

HS-168 Wesan Medical Equip. Co., 18462 Kesh Southfield

## NEW ORLEANS

### HOSPITALS

- H-1 Algiers General Hospital, 310 Opelousas Avenue
- H-2 Charity Hospital of La., At N.O., 1532 Tulane Avenue
- H-3 Crippled Children's Hospital, 200 Henry Clay Avenue
- H-4 DePaul Hospital, 1038 Henry Clay Avenue, Box 4040
- H-5 Eye, Ear, Nose, and Throat Hospital, 145 Elk Place
- H-6 Flint-Goodridge Hospital of Dillard University, 2425 La. Avenue
- H-7 Hotel Dieu Sisters Hosp., 2004 Tulane Avenue
- H-8 Illinois Central Hospital, 714 Magnolia Street
- H-9 Ochsner Foundation Hosp., 1516 Jefferson Hwy.
- H-10 St. Claude Gen'l Hosp., 3501 St. Claude Avenue
- H-11 SaraMayo Hospital, 625 Jackson Avenue
- H-12 Southern Baptist Hosp., 2700 Napoleon Avenue
- H-13 Touro Infirmary, 1400 Foucher Street
- H-14 U.S. Public Health Service Hospital, 210 State Street
- H-15 Veterans Adm. Hosp., 1601 Perdido Street
- H-16 Jefferson House Rehabilitation Hospital, 1800 Jefferson Hwy.
- H-17 Mercy Hospital, 301 N. Jefferson Davis Pkwy.
- H-18 Montelepre Memorial Hosp., 3125 Canal Street
- H-19 Chalmette-St. Bernard Parish, 504 St. Bernard Gen't Hosp., 2111 Jackson Blvd.
- H-20 Marrero-Jefferson Parish, 504 West Jefferson Gen'l Hosp, 4500 11th St.
- H-21 Metairie-Jefferson Parish, 504 Lakeside Hosp. for Women and Children, 1825 Vets.
- H-22 New Orleans-Metairie Hosp, 310 Codifer Blvd.
- H-26 Methodist Home-Hospital, 815 Washington Avenue, New Orleans
- H-27 Covington, Louisiana Community Center (PDH)
- H-28 Bunker 204, Slidell, Louisiana (PDH)
- H-29 Slidell Memorial Hospital, Slidell Louisiana (PDH)

NEW ORLEANS

CONVALESCENT HOSPITALS

CH-1 Taylor House Extended Care Unit of SB Hospital, 1421 General Taylor

CH-2 Landun Sanitorium, 1006 Washington Avenue

## NEW ORLEANS

### NURSING HOMES

- N-1 Blisshaven Nursing Home, 1034 S. Carolton Avenue
- N-2 Elysian Convalescent Home, 4000 Dumaine
- N-4 Geri-Kay Nursing Home, 1212 Poland Avenue
- N-5 Guest House of Harvey Nursing Home, Harvey, La.
- N-6 Heritage Manor Nursing Home, August Avenue, Marrero
- N-8 Hubbard Estelle Memorial Home for Incurables, 3300 Hamilton
- N-9 Jessica Nursing Home, 4617 Prytania
- N-10 LeLe Nursing Home, 2019 N. Romn
- N-11 Little Sisters of the Poor, 1501 N. Johnson
- N-12 Lodwick Manor, 5407 Dauphine
- N-13 Louisiana Freedman Home, 3105 Audubon
- N-14 Lynn Nursing Home, 1007 Jackson Avenue
- N-15 Maison Orleans Nursing Home, 2310 Mehle Avenue
- N-16 Manhattan Manor Guest House & Nursing Home, 1020 Manhattan Blvd.
- N-18 Plantation Nursing Homes of N.O. Inc., 7300 Chef Menteur Hwy.
- N-19 Plantation (Providence) Nursing Homes of N.O. Inc., 1539 Delachaise St.
- N-20 Poydras, Manor, Poydras, La.
- N-21 Prayer Town Rest Home, 3327 Lowrine
- N-22 Roman Nursing Homes, 1641 Amelia
- N-23 Roman Nursing Homes, 1737 Jackson Avenue
- N-24 Ruth Ellen Nursing Home, 1202 Camp

NEW ORLEANS

GOVERNMENT HEALTH DEPARTMENTS AND OFFICES

- GH-1 La. State Dept. of Health-Director, 325 Loyola Avenue
- GH-2 DHEW-Drug Abuse Control, 701 Loyola Avenue
- GH-3 DHEW-PHS-Offices, 210 State
- GH-4 PHS-Quarantine Station, 3819 Patterson Rd.
- GH-5 PHS-Entomology Section, 3819 Patterson Rd.
- GH-6 Quarantine Officer-N.O. Int. Airport, Moisant Field
- GH-7 Treas. Dept. Bu. of Narcotics, 600 South
- GH-8 Jef. Park. Health Units, 111 N. Causeway Blvd. Met.
- GH-9 W. Jef. Park. Community Health Ctr., 1901 8th Harvey
- GH-10 Jef. Park. Rabies Control Center, 1969 Ames Blvd. Marrero
- GH-11 Metairie Mental Health Center, 111 N. Causeway Blvd. Met.
- GH-12 Mosquito Control Dept., 7001 Airline Hwy. Met.

ST. BERNARD'S PARISH-GOV'T

- GH-13 Nursing Home Program, Atlas Blvd., Arabi

NEW ORLEANS

PHARMACEUTICALS--MANUFACTURERS

- MH-1 American Quality Products Co., 1702 Howard Avenue
- MH-2 Angell, James R., 148 Normandy Avenue
- MH-3 Carrtone Labs., Inc., 4936 Vets. Mem. Hwy. Met.
- MH-4 Efficiency Labs., Inc., 1922 Arts Street
- MH-5 Gateway Labs., Inc., 4936 Vets. Mem. Hwy.
- MH-6 Jones, Ed., Inc., 121 Glenwood Drive
- MH-7 Keeney, J. R. Co., 604 Constance Street
- MH-8 Liquid Carbonic Corp., L&N Gossing & Industrial Canal
- MH-10 Meco Laboratory, 1619 Valence Street
- MH-11 Rilox Co., 2121 Independence Street
- MH-12 Ring Rout Inc., 1533 Prytania
- MH-13 Rogers, B.C. Feed Mill, Gretna, La.
- MH-14 Specialty Products Co., 433 Bourbon Street
- MH-15 Sullivan's Mineral Salve, 8815 Pritchard Pl.
- MH-16 Tichenor, G.A. Antiseptic Co. 1700 Barronne Street
- MH-17 Union Carbide Corp., 432 N. Anthony Street
- MH-18 Upjohn Company, 13000 Chef Menteur Hwy.



NEW ORLEANS

PHARMACEUTICALS--JOBBER AND WHOLESALERS

- WH-1 Abbott Laboratories, 916 Dakin Street
- WH-2 Alamis Co., Inc., 214 Magazine
- WH-3 Baxter Labs., Inc., 1100 Edwards Avenue
- WH-4 Cash Wholesale Drug Co., Inc., 4310 Hessmer Avenue, Met
- WH-5 Citywide Drugs, Inc., 4700 Freret
- WH-6 Classic Pharmacal Corp., 4936 Vets. Mem. Hwy. Met.
- WH-7 Imperial Trading Co., Inc., 325 Tchoupulas St.
- WH-8 Katz & Besthoff, Inc., 900 Camp Street
- WH-9 Lederle Labs., Division Amer. Cyan. Co., 824 Dakin Street
- WH-10 Lily Brown Co., 1225 St. Bernard Avenue
- WH-11 Lilly, Eli & Co., 225 Baronne
- WH-12 Lyons, I.L. Co. Ltd., 800 Tchoupulas Street
- WH-13 McKesson & Robbins Inc., 755 Magazine
- WH-14 Medco Co., Inc., 1640 Clio Street
- WH-15 Merck, Sharp & Dohme, 1431 E. Airline Hwy. Kenner
- WH-16 Meyer Bros. Drug Co., Inc., 4431 Euphrosine
- WH-17 Mon-Arc Welding Supply Co., 4833 Conti St.
- WH-18 Morris, J.C. Kitchen Aids, Inc., 727 S. Cortez
- WH-19 National Medical Prod. Corp., Audubon Blvd.
- WH-20 Ohio Chemical & Surgical Eq. Co., 240 St. George Street
- WH-21 Pan-American Labs., Inc., 2347 Filmore Avenue
- WH-22 Parke Davis & Co., 1007 Camp Street
- WH-23 Penner & Welsh, Inc., 2701 Keniston
- WH-24 Quinton Co., Division of Merck & Co., Inc., 1431 E. Airline Kenner
- WH-25 Richmond's Steamship, 638 Camp Street

NEW ORLEANS

- WH-26 Schwegmann Bros. Gant Mkt. Pharm., 5300 Gentilly Rd.
- WH-27 Southern Solvents & Chem. Corp., 917 Jefferson Hwy.
- WH-28 Standard Fruit & Steamship Co., 2 Canal St. P.O. 50830
- WH-29 Superior Pharmacal Corp., 402 S. Lopez St. Box 5162
- WH-30 Triangle Wholesale Drug Co., 7501 W.B. Expressway Marrero
- WH-31 Twentieth Century Whol. & Job., 118½ Met. Heights Met.
- WH-32 National Cylinder Gas Co., 529 Felicity St.
- WH-33 Vital Functions, Inc., 814 Baronne St.
- WH-34 Walgreen La., Co., Inc., 3909 Bignville St.
- WH-35 Weilbaecher, C.A., 1619 Abundance St.
- WH-36 West Wholesale Co., Inc. 210 Narcissus Dr. Met.
- WH-37 Trup's Pharmacy, 2100 Williams Blvd. Kenner

NEW ORLEANS

HEALTH SUPPLIES AND EQUIPMENT

- HS-1 A. Abbel Rents & Sales, 2234 Tulane Avenue  
A. American Rent All Inc.
- HS-2 Main Store, 3940 Tulane Avenue
- HS-3 Gentilly, 6322 Chef Menteur Hwy.
- HS-4 Gentilly, 2840 Elysian Fields Avenue
- HS-5 Uptown, 4812 Prytania
- HS-6 Metairie, 1220 N. Causeway Blvd.
- HS-7 Metairie, 1714 Vets. Memorial Hwy.
- HS-8 Gretna, 136 Lafayette
- HS-9 Chalmette, 8611 St. Bernard's Hwy.
- HS-10 Kenner, 2502 Airline Hwy.
- HS-11 Aloe Div. Brunswick Corp., 1425 Tulane
- HS-12 American Hospital Supply Corp., 4408 Catherine Avenue, Met.
- HS-13 American Sterilizer Co., 5534 Canal Blvd.
- HS-14 Baumann Surgical Supply Co., 3148 Paris Avenue
- HS-15 Colson Hospital Equip. St. Cyr Equip. Co., 1134 St. Charles Avenue
- HS-16 Convertors Inc., 2612 4th Harvey
- HS-17 Cutter Laboratories, 3900 Vets. Mem. Hwy.
- HS-18 Electro Medical Equipment, 5621 Bellaire Drive
- HS-19 IPCO Hospital Supply Corp., 3711 Division Met.
- HS-20 Knight, J. Hugh Instrument Co., 248 S. Robertson
- HS-21 Kramer's Foam & Fabric Ctr., 241 S. Galvez
- HS-22 Medical Devices, Inc., Labarre Road Met.
- HS-23 Mills Hospital Supply Co., 1319 St. Charles Avenue
- HS-24 So. Surgical Supply Co., Inc., 741 St. Charles Street

## NEW ORLEANS

- HS-25 Standard Surgical Supply Inc., 713 Camp
- HS-26 Wilmont Castle Co., 427 Carondelet
- HS-27 Adams & Tarso Orthopedic, 3601 Prytania
- HS-28 McDermott Surg. Inst. Co. Ltd., 734 Poydras
- HS-29 Orthopedic Specialties, 7100 Earhardt Blvd.
- HS-30 Snell's Limbs & Braces of N.O., 4332 St. Charles Avenue
- HS-31 Surgical Brace & Appli. Co., 1835 Tulane Avenue
- HS-32 Wolfe, Dean E., 3633 Prytania
- HS-33 Zimmer-Bryan Assn., 3412 Prytania
- HS-34 Crest Medical Supply Co., 4321 S. Claiborne Avenue
- HS-35 Honeywell Inc., 2271 Ridg Lk. Dr. Met.
- HS-36 Kincheloe, R.P. Co. Rlectrocardiograph, 4108 Dumaine
- HS-37 Physicians and Hospital Supp., Pere Marquette B.
- HS-38 Surgico, 4435 Baccich
- HS-39 Nachary-O'Connor Co., Inc. 318 Carondelet
- HS-40 Calonje Products Corp., 4434 Earhart Blvd.
- HS-41 General Electric Co., 7715 Edn Brgh
- HS-42 Picker X-Ray Corp., 1600 Baronne
- HS-44 Hanger, J.E. Inc., 3211 D'Hemecourt (GNO)
- HS-45 Crescent Safety Equip. Co., 21 5th Gretna
- HS-46 Puritan Medical Gases, 929 WB Expressway Gretna
- HS-48 Airco Industrial Gases Div., 1406 S. Rendon Street

PROVIDENCE

HOSPITALS

CENTRAL FALLS

H-2 Notre Dame Hosp., 1000 Broad Street

CRANSTON

H-3 Osteopathic General Hosp. of R.I., 1763 Broad Cranston

NORTH PROVIDENCE

H-5 Our Lady of Fatima Hospital, 200 High Service Avenue

PAWTUCKET

H-7 Memorial Hosp. Prospect Street

PROVIDENCE

H-8 Butler Hosp., 333 Grotto Avenue

H-9 Charles V. Chapin Hosp., 153 Eaton Street

H-10 Miriam Hosp., 164 Summit Avenue

H-11 Providence Lying-In Hosp., 50 Maude Street

H-12 R.I. Hosp., 593 Eddy Street

H-13 Roger Williams Gen'l Hosp. 825 Chalkstone Avenue

H-14 St. Joseph's Hosp., 21 Peace Street

H-15 Center Gen'l Hosp. Box 1

H-16 Institute of Mental Health Box 5

H-17 Veterans Adm. Hosp. Chalkstone Avenue

RIVERSIDE

H-18 Emma Pendleton Bradley Hosp., 1011 Vets Mem. Parkway

WARWICK

H-19 Ken Co. Mem'l Hosp., 455 Toll Gate Road

PROVIDENCE

PACKAGE DISASTER HOSPITALS

- H-22 11-0433 Kent County Memorial Hospital, 455 Toll Gate Road (PDH)
- H-23 10-0433 Building No. 1 American Hoechst Corp, Ouidnick Street (PDH)
- H-24 12-0897 Notre Dame Hospital, 1000 Broad Street, Central Falls (PDH)
- H-25 55130 Park View Junior High School, Park Avenue, Cranston (PDH)
- H-26 12-0492 Osteopathic General Hospital of Rhode Island, 1763 Broad Street (PDH)
- H-27 55112 Tolman High School Exchange Street (PDH)
- H-28 12-0505 Pawtucket Memorial Hospital Irospect Street (PDH)
- H-29 12-0433 Kent County Memorial Hospital, 455 Tollgate Road (PDH)
- H-30 12-0455 Roger Williams General Hospital, 825 Chalkstone Avenue (PDH)
- H-31 12-0634 Providence Lying-In Hospital, 50 Maude Street (PDH)

PROVIDENCE

NURSING HOMES

ATTLEBORO, NORTH ATTLEBORO, SOUTH ATTLEBORO

N-3 Fuller Memorial Sanitarium, Washington S. Attl.

PAWTUCKET, CENTRAL FALLS, LINCOLN, SMITHFIELD, AND CUMBERLAND

N-25 Bonnie View Nursing Home, 80 Summit Pawt.

N-26 Boulevard Nursing Home, Inc., 123 Armistice Blvd.

N-27 Cartie's Nursing Home, 21 Lincoln Avenue, Central Falls

N-28 Cote, Edna D., 132 Hunt Central Falls

N-31 Elm Brook Home, 40 Farnum Pike Sfld.

N-32 Fairlawn Convalescent Home, 109 West Lawn Avenue

N-33 Freebairn, Martha Mrs., 1614 Lonsdale Avenue

N-35 Gillis, Mary Nursing Home, 240 Broadway

N-36 Grandview Nursing Home, Chambers Cmb.

N-38 Homestead Nursing Home, Inc., 1015 Smithfield Avenue

N-39 Manchester Nursing Home, 12 Manchester Pawt.

N-40 Mansion Nursing Home, 104 Clay Central Falls

N-41 Maple Manor Convalescent Home, 1614 Lonsdale Avenue

N-42 Mary Gillis Nursing Home, 240 Broadway

N-43 Maynard Nursing Home, 56 Maynard

N-44 Mineral Spring Nursing Home, 107 Mineral Spring Avenue

N-45 Neighborhood Convalescent Home, Inc., 362 Daggett Avenue

N-46 Oak Hill Nursing Home, 544 Pleasant

N-47 Pawuette Nursing Home, Inc., 649 Broad Central Falls

N-48 Rose Cottage Nursing Home, 151 Hunt Central Falls

N-49 Theinert House, 33 Pleasant View Avenue., Smithfield

N-50 Waterman Heights Nursing Home, Inc., Putnam Pike, Smithfield

## PROVIDENCE

### PROVIDENCE AND SCITUATE

- N-51 Andreason Rest Home, 371 Blackstone Prov
- N-52 Attridge Nursing Home, 1196 Charles No. Prov.
- N-53 Bel-Aire Nursing Home, 803 Willett Avenue, E. Providence
- N-54 Belvedere Nursing Home, Inc. 1373 Smith N. Prov.
- N-55 Bianchi Nursing Home, 3427 Pawt. Avenue, E. Providence
- N-56 Carrie's Nursing Home, 421 Elmwood Avenue, Prov.
- N-57 Chaffee, Hattie Ide Home, Wampanoag Trail E. Prov.
- N-58 Charlton Nursing Home, 159 Prospect
- N-59 Donna-Leigh Convalescent Home, 66 Burnett
- N-60 Eleanor-Ann Nursing Home, 23 Grove Avenue
- N-61 Eriksson, Folke O. Mrs., 551 Potters Avenue
- N-62 Harris Nursing Home, 833 Broadway E. Providence
- N-63 Health Havens, 100 Wampanoag Trl.
- N-64 Hillcrest Nursing Home, 198 Waterman Avenue
- N-65 Lovett Nursing Home, 37 Congress Avenue
- N-66 Lynn-Ann Nursing Home, 292 Elmwood Avenue
- N-67 Maples Convalescent Home, 3179 Pawt. Avenue
- N-68 Metcalf, Donald Mrs., 631 Public
- N-69 Nat'l Nursing Homes, Inc. 228 Webst
- N-70 Park View Nursing Home, 31 Parade Prov.
- N-71 Price Nursing Home, Inc., 15 Cherry Prov.
- N-72 Riccardi's Nursing Home, Danielson Pike N. Scituate
- N-73 Riverside Nursing Home, 336 Willett Avenue, E. Prov.
- N-74 Ruth's Nursing Home, 26 Fourth E. Prov.
- N-75 St. Elizabeth Home, 109 Melrose Prov.
- N-76 Skidd's Convalescent Home, 654 Cranston Prov.



PROVIDENCE

WARWICK, WARREN, AND COVENTRY

- N-78 Avalon Nursing Home, Inc., 57 Stokes
- N-79 Brentwood Nursing Home, Inc., 3986 Post Rd.
- N-80 Buttonwoods Crest Nursing Home, 139 Hemlock Avenue
- N-81 Chrisdale Convalescent Home, 979 Centreville Road
- N-85 Fairview Manor, 502 Hill Cov.
- N-87 Greenwood House Nursing Home, 1139 Main Avenue
- N-88 Hillside Nursing Home, 56 Youngs Av.
- N-89 Kent Nursing Home, 660 Commonwealth Avenue
- N-90 Koehler Home for Aged and Convalescent
- N-91 Merrymount Nursing Home, 767 S. Main
- N-93 Riverview Nursing Home, 546 Main Cov.
- N-95 SunnyView Nursing Home, 83 Corona

WOONSOCKET

- N-100 Delmar Nursing Home, Inc., 70 Woodland Road
- N-103 Hebert's Nursing Home, Log Road

PROVIDENCE

GOVERNMENT HEALTH & MEDICAL FACILITIES

ATTLEBORO

GH-5 CENTRAL FALLS Water Dept., 77 Hunt CF

GH-6 CRANSTON Sewer Dept. (Main Office), 20 Phenix Avenue

PAWTUCKET

GH-13 Sanitation Dept., Armistice Blvd.

GH-14 Water Dept. Pumping Station #1, Branch

PROVIDENCE

GH-15 Health Dept., 161 Fountain Prov.

GH-16 Garbage Collections, Terminal Rd., Fields Pt.

GH-17 Sewerage Dept. Disposal Wks. Offc., 2 Ernest Prov.

GH-19 Water Supply Board, 552 Academy Avenue

WARWICK

GH-21 Sewer Authority (Adm. Ofc.), 300 Service Road

GH-22 Water Dept. (Adm. Ofc.), 3275 Post Road, Warwick

PROVIDENCE

PHARMACEUTICALS--MANUFACTURERS

PAWTUCKET, CENTRAL FALLS, AND CUMBERLAND

- MH-1 Adams Drug Co., Inc., 75 Sabin St.
- MH-2 Denison Laboratories, Inc., 60 Dunnell Ln.
- MH-3 Horsemen's Products Corp., 193 Beverage Hill Avenue
- MH-4 Horsemen Veterinary Supp. Co., 197 Mineral Spring Avenue
- MH-5 New England Reagent Labiry., 501 Bullocks Pt.

PROVIDENCE

- MH-6 Cartier's and Gonya's, 242 Reservoir Avenue
- MH-7 Chemical Industrial Co., 139 Knight St.
- MH-8 Claflin Company, 1 Acorn Street
- MH-9 Crown Chemical Co., 12 Dudley St.
- MH-10 Mahler's Inc., 3124 Pawtucket Avenue
- MH-12 Welsh Manufacturing Co., 9 Magnolia Street
- MH-13 White Cross Chemicals, 1254 Douglas Avenue
- MH-14 Denison Laboratories, Inc., 5 Randall

WARWICK AND CRANSTON

- MH-15 Boss & Seiffert Co. Inc., 1701 Cranston Street
- MH-16 Arlington Grain Store, Depot Avenue
- MH-17 Crompton Grain Co., Inc., 8 Bridge Street
- MH-18 Geigy Chemical Corp., 180 Mill Street
- MH-19 Original Bradford Soap Works Inc., 200 Providence Street
- MH-20 Scot-Tussin Pharmacal Co., Inc., 50 Clemance Street
- MH-21 Torbot Co., Inc., 1185 Jefferson Blvd.

SURGICAL INSTRUMENTS--MANUFACTURERS

- MH-22 Ace Engineering Inc., 139 Plainfield
- MH-23 Professional Instruments, Inc., 477 Elmwood Avenue

PROVIDENCE

SURGICAL SUPPLIES

MH-24 Nat'l Manufacturing Co., 117 Warren Avenue

PROVIDENCE

WHOLESALE

PHARMACEUTICALS--PAWTUCKET, CENTRAL FALLS, AND REHOBOTH, MASS.

WH-1 Hannaway, R. T., Inc., 40 Conant St.

WH-3 Northeastern Pharmaceutical Sales, 10 Central Street

PROVIDENCE

WH-4 C&S Packing Co., Inc., 21 Stevens Street

WH-5 Delta Drug Inc., 1450 Smith Street

WH-6 Lepore, A.C., Sons Wholesale Drugs, 802 Atwells Avenue

WH-7 McKesson & Robbins, Inc., 204 Hartford Avenue

WH-8 Providence Wholesale Drug, 200 Niantic Avenue

WH-9 Sealox, Inc., 110 India St.

WH-10 Eastern Scientific Co., 267 Plain Street

SURGICAL SUPPLIES--PROVIDENCE

WH-15 R V C Inc., 50 Delaine

WH-16 Sullivan Distributing Co., Gleaner Chapel Road

X-RAY APPARATUS

WH-17 Gen'l Electric X-Ray, 241 Harris Avenue

WH-18 Picker X-Ray Equip. & Supp., E. Prov.

## PROVIDENCE

### HEALTH SUPPLY

#### PROVIDENCE, CENTRAL FALLS, CRANSTON, AND EAST GREENWICH

- HS-1 A&B Hospital Rentals, 602 Elmwood Prov.
- HS-2 Esco Drug Co., 110 Lockwood
- HS-3 Gen'l Electric Co., 241 Harris Avenue
- HS-4 Jerry's Chemist Shop, 1678 Broad Crns.
- HS-6 LaSalle Pharmacy
- HS-7 Lifteez New England, Inc., 117 Warren Avenue
- HS-8 Paulis Silk Co., 131 Clay CF
- HS-9 Roberts Medical Supply Co., 79 Burlington Prov.
- HS-10 Stark & Wisk Inc., 1013 Reservoir Avenue
- HS-11 Zylon Products, Inc., 225 Wampanoag Tri.

#### ORTHOPEDIC APPLIANCES--PROVIDENCE

- HS-12 Artificial Limb Co., 602 Elmwood Avenue
- HS-13 Orthopedic Appliance and Brace Center, 205 Broadway
- HS-14 Orthopedic Services, of R.I., 340 Broad

#### OXYGEN THERAPY EQUIPMENT--PROVIDENCE

- HS-15 Ambulance & Oxygen Service, 156 Warren Avenue
- HS-16 Medical Gas & Supplies (Div., of Inc. Welders Sup. Co.) 396 Manton Avenue

#### X-RAY SUPPLIES--CRANSTON

- HS-19 Keleket X-Ray Div. Lab for Elec. Inc., 75 Greylek Avenue

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## 13. ABSTRACT

This report is an assessment of the damage from a specific nuclear attack to the medical resources (personnel as well as facilities and supplies) of the following five U.S. Cities

1. San Jose, California
2. Albuquerque, New Mexico
3. Detroit, Michigan
4. New Orleans, Louisiana
5. Providence, Rhode Island

The post-attack medical care capability is discussed for each of the five cities, in terms of the Post-Attack Health Resources available to implement Emergency Health Services

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